H 5

```
   SSSSSSSSSSSS     000000000     RRRRRRRRRRRR     TTTTTTTTTTTTTTT     333333333        222222222
   SSSSSSSSSSSS     000000000     RRRRRRRRRRRR     TTTTTTTTTTTTTTT     333333333        222222222
   SSSSSSSSSSSS     000000000     RRRRRRRRRRRR     TTTTTTTTTTTTTTT     333333333        222222222
SSS              000         000  RRR         RRR        TTT        333         333  222         222
SSS              000         000  RRR         RRR        TTT        333         333  222         222
SSS              000         000  RRR         RRR        TTT        333         333  222         222
SSS              000         000  RRR         RRR        TTT                    333              222
SSS              000         000  RRR         RRR        TTT                    333              222
SSS              000         000  RRR         RRR        TTT                    333              222
   SSSSSSSSS     000         000  RRRRRRRRRRRR           TTT                 333              222
   SSSSSSSSS     000         000  RRRRRRRRRRRR           TTT                 333              222
   SSSSSSSSS     000         000  RRRRRRRRRRRR           TTT                 333              222
            SSS  000         000  RRR   RRR              TTT                    333        222
            SSS  000         000  RRR   RRR              TTT                    333        222
            SSS  000         000  RRR   RRR              TTT                    333        222
            SSS  000         000  RRR      RRR           TTT        333         333     222
            SSS  000         000  RRR      RRR           TTT        333         333     222
            SSS  000         000  RRR      RRR           TTT        333         333     222
SSSSSSSSSSSS        000000000     RRR         RRR        TTT           333333333     222222222222222
SSSSSSSSSSSS        000000000     RRR         RRR        TTT           333333333     222222222222222
SSSSSSSSSSSS        000000000     RRR         RRR        TTT           333333333     222222222222222
```

```
_$2

Pse
---
SOR

SOR

SOR

SOR

_LI
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```
                                      F 14
**FILE**ID**SORSCRIO









  SSSSSSSS    OOOOOO    RRRRRRRR      SSSSSSSS    CCCCCCCC  RRRRRRRR      IIIIII      OOOOOO
  SSSSSSSS    OOOOOO    RRRRRRRR      SSSSSSSS    CCCCCCCC  RRRRRRRR      IIIIII      OOOOOO
SS          OO      OO  RR      RR  SS          CC          RR      RR      II      OO      OO
SS          OO      OO  RR      RR  SS          CC          RR      RR      II      OO      OO
SS          OO      OO  RR      RR  SS          CC          RR      RR      II      OO      OO
SS          OO      OO  RR      RR  SS          CC          RR      RR      II      OO      OO
  SSSSSS    OO      OO  RRRRRRRR      SSSSSS    CC          RRRRRRRR        II      OO      OO
  SSSSSS    OO      OO  RRRRRRRR      SSSSSS    CC          RRRRRRRR        II      OO      OO
        SS  OO      OO  RR  RR              SS  CC          RR  RR          II      OO      OO
        SS  OO      OO  RR  RR              SS  CC          RR  RR          II      OO      OO
        SS  OO      OO  RR    RR            SS  CC          RR    RR        II      OO      OO      ....
        SS  OO      OO  RR    RR            SS  CC          RR    RR        II      OO      OO      ....
SSSSSSSS      OOOOOO    RR      RR  SSSSSSSS      CCCCCCCC  RR      RR    IIIIII      OOOOOO        ....
SSSSSSSS      OOOOOO    RR      RR  SSSSSSSS      CCCCCCCC  RR      RR    IIIIII      OOOOOO        ....


LL            IIIIII      SSSSSSSS
LL            IIIIII      SSSSSSSS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II        SSSSSS
LL              II        SSSSSS
LL              II              SS
LL              II              SS
LL              II              SS
LL              II              SS
LLLLLLLLLL    IIIIII    SSSSSSSS
LLLLLLLLLL    IIIIII    SSSSSSSS
```

```
0 MODULE SOR$SCR_IO (
0               IDENT = 'V04-000'       ! File: SORSCRIO.B32 Edit: PDG3053
0               ) =
1 BEGIN
1 !
1 !****************************************************************************
1 !*                                                                          *
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1 !****************************************************************************
1 !
1
1 !++
1 !
1 ! FACILITY:     VAX-11 SORT/MERGE
1 !
1 ! ABSTRACT:
1 !
1 !       This module contains RMS I/O support for work/scratch files.
1 !
1 ! ENVIRONMENT:  VAX/VMS user mode
1 !
1 ! AUTHOR: Peter D Gilbert, CREATION DATE: 10-May-1982
1 !
1 ! MODIFIED BY:
1 !
1 !       T03-015         Original
1 !       T03-016 Fix problem with computing COM_BUF SIZE (due to DDB not set).
1 !               Check status after calling COM_INPUT.  PDG 13-Dec-1982.
1 !       T03-017 Errors opening scratch files now recoverable.  PDG 16-Dec-1982
1 !       T03-018 Make write errors to a work file fatal.  PDG 22-Dec-1982
1 !       T03-019 Make the size of the buffer passed to the user-written input
1 !               routine for merges equal to the LRL (rather than larger).
1 !               PDG 26-Dec-1982.
1 !       T03-020 Changed to use QIOWs for work file I/O.
1 !               Added protection XAB.  PDG 28-Dec-1982
1 !       T03-021 Make work-file description blocks (WFBs) distinct from DDBs.
1 !               PDG 31-Dec-1982
1 !       T03-022 Added clean-up routines.  PDG 4-Jan-1983
1 !       T03-023 Added a FNS parameter to WORK_OPEN.  PDG 6-Jan-1983
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;    58          0058   1 !          T03-024 Remove declaration of unreferenced externals.  PDG 26-Jan-1983
;    59          0059   1 !          T03-025 Added WFB_USE field.  Set COM_MRG_STREAM to the file or stream
;    60          0060   1 !                  number.  PDG 27-Jan-1983
;    61          0061   1 !          T03-026 Use COM_MERGE (rather than COM_MRG_ORDER) to indicate a merge.
;    62          0062   1 !                  PDG 31-Jan-1983
;    63          0063   1 !          T03-027 Changes for hostile environment.  PDG 3-Feb-1983
;    64          0064   1 !          T03-028 Pass the context address to callback routines.  PDG 11-Feb-1983
;    65          0065   1 !          T03-029 Make SOR$_NO_WRK fatal in WORK_OPEN.  PDG 9-Mar-1983
;    66          0066   1 !          T03-030 Maximize DEQ with TUN_K_BUFSIZE.  PDG 31-Mar-1983
;    67          0067   1 !          T03-031 Information hiding of WFB structure.  PDG 12-Apr-1983
;    68          0068   1 !          T03-032 Remove declaration of WFB_DEV.  PDG 13-Apr-1983
;    69          0069   1 !          T03-033 Make DELRUN and POSITION non-global routines.  Call FLUSH with
;    70          0070   1 !                  COM_RUN_CURR in SOR$$WORK_MERGE.  Remove DST parameter from
;    71          0071   1 !                  WORK_MERGE routines.  PDG 14-Apr-1983
;    72          0072   1 !          T03-034 Move definitions of fields specific to scratch-i/o from SORLIB
;    73          0073   1 !                  into this module.  PDG 18-Apr-1983
;    74          0074   1 !          T03-035 Massive changes; better use of scratch file space, by allowing
;    75          0075   1 !                  runs to be composed of little pieces (RDBs).  PDG 22-Apr-1983
;    76          0076   1 !          T03-036 Page align the work file buffers.  PDG 27-Apr-1983
;    77          0077   1 !          T03-037 Check for more than 127 pages in WORK_WRITE.  PDG 28-Apr-1983
;    78          0078   1 !          T03-038 Add stuff for operator assistance (in comments).  29-Apr-1983
;    79          0079   1 !          T03-039 Free RDBs linked to RUN_BLOCKs in CLEAN_UP.
;    80          0080   1 !                  Free file name string on error in WORK_OPEN.  PDG 2-May-1983
;    81          0081   1 !          T03-040 Change BLOCK[.NEW[RDB_WFB],WFB_FULL] to BBLOCK.  PDG 9-May-1983
;    82          0082   1 !          T03-041 Change severity of LIB$FREE_EF errors.  PDG 6-Sep-1983
;    83          0083   1 !                  Don't FREE_VM pieces of memory gotten from GET_VM.
;    84          0084   1 !          T03-042 Apply Jack's Law to identical pieces of code in POSITION and
;    85          0085   1 !                  SOR$$WORK_READ.
;    86          0086   1 !          T03-043 Use the CHECKPOINT facility.  PDG 19-Sep-1983
;    87          0087   1 !          T03-044 SOR$$BEST_FILE_NAME assumes NAM$B_RSL and NAM$B_ESL are zero
;    88          0088   1 !                  before the OPEN or CREATE.  PDG 10-Nov-1983
;    89          0089   1 !          T03-045 Conditionalize checkpointing code.  PDG 17-Jan-1984
;    90          0090   1 !          T03-046 Make CFT_CON_ADR relative.  PDG 25-Jan-1984
;    91          0091   1 !          T03-046 Correct the calculation finding the address for work file names
;    92          0092   1 !                  gotten from COM_CFT_ADR.  PDG 1-Feb-1984
;    93          0093   1 !          T03-047 Correct version ident.
;    94          0094   1 !          T03-048 Add support for VAXELN.  Jeff East 1/2/84
;    95          0095   1 !          T03-049 Add recovery from RMS$_RLK errors.  PDG 2-Apr-1984
;    96          0096   1 !          T03-050 Code improvements in MRG_WORK_READ.  Clear VFC area for merges.
;    97          0097   1 !                  Improve error reporting when NO scratch files can be found.
;    98          0098   1 !                  PDG 9-Apr-1984
;    99          0099   1 !          T03-051 Fix minor R0 problem in MRG_WORK_READ for hostile environment.
;   100          0100   1 !                  PDG 15-May-1984
;   101          0101   1 !          T03-052 Add WFB_ERRORS to avoid infinite loop when we run out of
;   102          0102   1 !                  work file space.  PDG 19-JUN-1984
;   103          0103   1 !          T03-053 Change COM_RHB to COM_RHB_INP and COM_RHB_OUT.
;   104          0104   1 !                  This is to avoid problems with merge, where an incoming
;   105          0105   1 !                  record overwrites the VFC area for the outgoing record.
;   106          0106   1 !                  PDG 24-Jul-1984
;   107          0107   1 !--
;  109           0108   1 LIBRARY 'SYS$LIBRARY:STARLET';
;  110           0109   1 LIBRARY 'SYS$LIBRARY:XPORT';
;  111           0110   1 REQUIRE 'SRC$:COM';
;  112           0180   1
;  113           0181   1 %IF %DECLARED(%QUOTE $DESCRIPTOR) %THEN UNDECLARE %QUOTE $DESCRIPTOR; %FI
;  114           0182   1
;  115           0183   1 FORWARD ROUTINE
;  116           0184   1     SOR$$WORK_MERGE:     CAL_CTXREG NOVALUE,      ! Determine which runs to merge
;  117           0185   1     SOR$$WORK_NEWRUN:    JSB_NEWRUN NOVALUE,      ! Start a new LONG run
;  118           0186   1     SOR$$WORK_WRITE:     JSB_OUTPUT,              ! Write to a work file
;  119           0187   1     SOR$$WORK_READ:      JSB_INPUT,               ! Read from a work file
;  120         U 0188   1 %IF FUN_K_CHECKPOINT %THEN
;  121         U 0189   1     SOR$$CHECKPOINT:     CAL_CTXREG NOVALUE,      ! Take a checkpoint
;  122         U 0190   1     PSH_CHECKPOINT,                               ! Post-checkpoint handler
;  123           0191   1 %FI
;  124           0192   1     SOR$$WRK_ALQ:        CAL_CTXREG,              ! Calculate work file allocation
;  125           0193   1     GET_BUFFER:          CAL_CTXREG NOVALUE,      ! Get a buffer
;  126           0194   1     FREE_BUFFER:         CAL_CTXREG NOVALUE,      ! Put a buffer on the free list
;  127           0195   1     POSITION:            CAL_CTXREG NOVALUE,      ! Position to start of a run
;  128           0196   1     MRG_WORK_MERGE:      CAL_CTXREG NOVALUE,      ! Set up for merge
;  129           0197   1     MRG_WORK_READ:       JSB_INPUT,               ! Read from a file for merge
;  130           0198   1     WORK_OPEN:           CAL_CTXREG NOVALUE,      ! Open a work file
;  131           0199   1     FLUSH:               CAL_CTXREG NOVALUE,      ! Flush a buffer
;  132           0200   1     GET_RDB:             CAL_CTXREG NOVALUE,      ! Get a hole
;  133           0201   1     FREE_RDB:            CAL_CTXREG NOVALUE,      ! Free a hole
;  134           0202   1     NEWRUN:              CAL_CTXREG NOVALUE,      ! Start a new run
;  135           0203   1     DELRUN:              CAL_CTXREG,              ! Indicate run no longer needed
;  136           0204   1     CLEAN_UP:            CAL_CTXREG NOVALUE;      ! Release resources
;  137           0205   1
;  138           0206   1 SOR$$END_ROUTINE_(CLEAN_UP);                      ! Declare a clean-up routine
;  139           0207   1
;  140         U 0208   1 %IF HOSTILE %THEN
;  141         U 0209   1     MACRO
;  142         U 0210   1         LIB$GET_VM = SOR$LIB$GET_VM %,
;  143         U 0211   1         SYS$QIOW = SOR$SYS$QIOW %,
;  144         U 0212   1         SYS$CREATE = SOR$SYS$CREATE %,
;  145         U 0213   1         SYS$DASSGN = SOR$SYS$DASSGN %;
;  146           0214   1 %FI
;  147           0215   1
;  148           0216   1 EXTERNAL ROUTINE
;  149           0217   1     SOR$$BEST_FILE_NAME:CAL_CTXREG NOVALUE,
;  150           0218   1     SOR$$FREE_FILE_NAME:CAL_CTXREG NOVALUE,
;  151           0219   1     SOR$$ALLOCATE:       CAL_CTXREG,                          ! Allocate storage
;  152           0220   1     SOR$$DEALLOCATE:     CAL_CTXREG NOVALUE,                  ! Deallocate storage
;  153           0221   1     %IF NOT HOSTILE %THEN
;  154           0222   1     LIB$GET_EF:          ADDRESSING_MODE(GENERAL),            ! Get an event flag
;  155           0223   1     LIB$FREE_EF:         ADDRESSING_MODE(GENERAL),            ! Free event flag
;  156           0224   1     %FI
;  157           0225   1     LIB$GET_VM:          ADDRESSING_MODE(GENERAL),
;  158         U 0226   1     %IF FUN_K_CHECKPOINT %THEN
;  159         U 0227   1     CHK$CHKPNT:          ADDRESSING_MODE(GENERAL) WEAK,
;  160         U 0228   1     CHK$DCLPSH:          ADDRESSING_MODE(GENERAL) WEAK,
;  161         U 0229   1     CHK$DCLRSH:          ADDRESSING_MODE(GENERAL) WEAK,
;  162         U 0230   1     CHK$CANPSH:          ADDRESSING_MODE(GENERAL) WEAK,
;  163         U 0231   1     CHK$CANRSH:          ADDRESSING_MODE(GENERAL) WEAK,
;  164           0232   1     %FI
;  165           0233   1     SOR$$ERROR;                                               ! Issue diagnostics
;   166            0234   1
;   167          U 0235   1  %IF FUN_K_CHECKPOINT %THEN
;   168          U 0236   1  EXTERNAL LITERAL
;   169          U 0237   1      CHK$_NOTINIT:          WEAK;
;   170            0238   1  %FI
;   171            0239   1
;   172            0240   1  LITERAL
;   173            0241   1      FUN_K_ASSIST =       FALSE   AND NOT HOSTILE;
;   174            0242   1
;   175            0243   1  ! This literal determines how frequently checkpoints are done.
;   176            0244   1  ! A count-down counter, COM_COUNTDOWN is decremented by one for:
;   177            0245   1  !       each record released to / read by the sort/merge,
;   178            0246   1  !       each record returned from / written by the sort/merge, and
;   179            0247   1  !       each block written to / read from a scratch file.
;   180            0248   1  ! When the counter goes negative, a checkpoint is taken.
;   181            0249   1  !
;   182            0250   1  LITERAL
;   183            0251   1      TUN_K_ONE_MINUTE =   60000,          ! About one minute???, standalone 780
;   184            0252   1      TUN_K_COUNTDOWN =    TUN_K_ONE_MINUTE * 10;  ! Every ten minutes
;   185            0253   1
;   186            0254   1  MACRO
;   187            0255   1      FREE_RDB_(X, FLD) = FREE_RDB(X, %FIELDEXPAND(FLD,0)) %,
;   188            0256   1      MOVE_ALL_RDBS_(Q, FLD) = WHILE .Q NEQ 0 DO FREE_RDB_(Q, FLD) %;
;  190          0257   1 !                          CONTEXT AREA
;  191          0258   1 !
;  192          0259   1 !      The following fields in the context area are referenced only by this
;  193          0260   1 !      module.
;  194          0261   1 !
;  195          0262   1 $FIELD
;  196          0263   1     S_FIELDS =
;  197          0264   1         SET
;  198          0265   1         $OVERLAY(COM_SCRATCH_IO)
;  199          0266   1         S_0=            [$BYTES(0)],
;  200          0267   1         S_BUF_FREE=     [XADDR],        ! Pointer to free list of buffers
;  201          0268   1         S_BUF_SIZE=     [XLONG],        ! Size in bytes of a buffer
;  202          0269   1         S_RUN_CURR=     [XADDR],        ! Address of current run block
;  203          0270   1         S_RUN_INFO=     [XADDR],        ! Address of list of run descriptions
;  204          0271   1         S_WRK_DEQ=      [XLONG],        ! Default extend amount for work files
;  205          0272   1         S_WRK_EFN=      [XLONG],        ! Event flag to use for work files
;  206          0273   1         S_WRK_WFB=      [XADDR],        ! Address of work file WFBs
;  207          0274   1         S_BUF_ALLOC=    [XADDR],        ! Pointer to list of allocated buffers
;  208          0275   1         S_PSH_HANDLER=  [XLONG],        ! Handler-id for post-checkpoint handler
;  209          0276   1         S_RSH_HANDLER=  [XLONG],        ! Handler-id for restart handler
;  210          0277   1         S_1=            [$BYTES(0)]
;  211          0278   1         TES;
;  212          0279   1
;  213          0280   1 LITERAL TMP_K_SCRATCH = %FIELDEXPAND(S_1,0)-%FIELDEXPAND(S_0,0);
;  214          0281   1 ASSERT (TMP_K_SCRATCH LEQ COM_K_SCRATCH)
;  215        L 0282   1 %IF TMP_K_SCRATCH LSS COM_K_SCRATCH
;  216        U 0283   1 %THEN %MESSAGE('COM_K_SCRATCH can be reduced from ', %NUMBER(COM_K_SCRATCH),
;  217          0284   1         ' to ', %NUMBER(TMP_K_SCRATCH)) %FI
;  218          0285   1
;  219          0286   1 STRUCTURE
;  220          0287   1         BBLOCK[O,P,S,E;BS=0] = [BS](BBLOCK+O)<P,S,E>;
;   222          0288  1 !                         WORK FILE DESCRIPTION BLOCK
;   223          0289  1 !
;   224          0290  1 !        The WFB contains information for reading/writing a work file.
;   225          0291  1 !
;   226          0292  1 !        The media storage for each WFB is described by non-overlapping RDBs,
;   227          0293  1 !        with each media block represented in exactly one RDB.  To simplify
;   228          0294  1 !        processing, a distinguished end-of-file RDB represents a near-infinite
;   229          0295  1 !        amount of media blocks that would be available if the work file were
;   230          0296  1 !        extended.  The RDBs that are not currently holding part of a run are
;   231          0297  1 !        linked into one of three lists in the WFB.
;   232          0298  1 !
;   233          0299  1 !        WFB_FULL contains RDBs that are the least desirable for holding runs.
;   234          0300  1 !        Usually, only the end-of-file RDB is on this list; this causes other
;   235          0301  1 !        RDBs to be reused rather than increasing the work file allocation.
;   236          0302  1 !
;   237          0303  1 !        WFB_FREE and WFB_NOUSE contain RDBs that are available to hold runs.
;   238          0304  1 !        The distinction is important when checkpointing is done.  Because the
;   239          0305  1 !        information in the work files is not checkpointed, the checkpointed
;   240          0306  1 !        data structures in memory must represent a valid interpretation of the
;   241          0307  1 !        data stored in the work files, so that a restart from the previous
;   242          0308  1 !        checkpoint will still result in a correct sort.  We may overwrite data
;   243          0309  1 !        in media blocks only if the checkpointed data structures indicate that
;   244          0310  1 !        there is no useful data in those blocks.
;   245          0311  1 !
;   246          0312  1 !        WFB_NOUSE contains RDBs that have been checkpointed as containing no
;   247          0313  1 !        useful data.  WFB_FREE contains the other RDBs that contain no useful
;   248          0314  1 !        data.  Thus, RDBs should be allocated from WFB_NOUSE and released to
;   249          0315  1 !        WFB_FREE.  Just after a checkpoint is taken, the RDBs are moved from
;   250          0316  1 !        WFB_FREE to WFB_NOUSE.
;   251          0317  1 !
;   252          0318  1 $UNIT_FIELD
;   253          0319  1         WFB_FIELDS =
;   254          0320  1         SET
;   255          0321  1         WFB_NEXT=       [XADDR],                ! Pointer to next WFB
;   256          0322  1         WFB_NAME=       [$SUB_BLOCK(2)],        ! File name length/address
;   257          0323  1         WFB_ALQ=        [XLONG],                ! Allocation
;   258          0324  1         WFB_FREE=       [XADDR],                ! Free RDBs for this work file
;   259          0325  1         WFB_NOUSE=      [XADDR],                ! Free RDBs for this work file
;   260          0326  1         WFB_FULL=       [XADDR],                ! Unusable RDBs for this WFB
;   261          0327  1         WFB_ERRORS=     [XWORD],                ! Error count
;   262          0328  1         WFB_CHAN=       [XWORD]                 ! Channel number
;   263          0329  1 !       WFB_DEV=        [XLONG]                 ! Device characteristics
;   264          0330  1 !       WFB_DVI=        [$BYTES(1+NAM$S_DVI)]   ! ASCIC Device name
;   265          0331  1         TES;
;   266          0332  1 LITERAL
;   267          0333  1         WFB_K_SIZE=     $FIELD_SET_UNITS;       ! Size in bytes
;   268          0334  1 MACRO
;   269          0335  1         WFB_BLOCK=      %EXPAND $UNIT_BLOCK(WFB_K_SIZE) FIELD(WFB_FIELDS) %;
;   270          0336  1
;   271        L 0337  1 %MESSAGE('WFB_K_SIZE = ', %NUMBER(WFB_K_SIZE), ' bytes')
```

```
  1 !                        R U N   B L O C K
  1 !
  1 !
  1 !       A run is a sequence of records that are known to be in order.
  1 !       The merge pass merges these runs.  The information necessary to
  1 !       position to the start of each run is stored in the following data
  1 !       structure.
  1 !
  1 !       Run blocks on the S_RUN_INFO list:
  1 !               identify the location and length of a run of records.
  1 !
  1 !       On output:
  1 !               RUN_VBN   - VBN of the next block to write.
  1 !               RUN_SIZE  - number of blocks written to the run so far.
  1 !               RUN_BUFF0 - number of free bytes in the buffer.
  1 !               RUN_BUFF1 - address of the first free byte in the buffer.
  1 !
  1 !       On input:
  1 !               RUN_VBN   - VBN of the next block to read.
  1 !               RUN_SIZE  - number of blocks in this run.
  1 !               RUN_BUFF0 - bytes in the buffer that haven't been read yet.
  1 !               RUN_BUFF1 - address of first byte that hasn't been read yet.
  1 !
  1 $UNIT_FIELD
  1         RUN_FIELDS=
  1         SET
  1         RUN_NEXT=       [XADDR],                ! Pointer to next run block
  1         RUN_DDB=        [XADDR],                ! Addr of DDB for merge stream
  1         RUN_VBN=        [XLONG],                ! VBN of first block in run
  1         RUN_SIZE=       [XLONG],                ! Blocks in this run
  1         RUN_RDB_CURR=   [XADDR],                ! Current RDB
  1         RUN_BUFFER=     [XADDR],                ! Pointer to buffer
  1         RUN_BUFF0=      [XLONG],                ! Remaining length in buffer
  1         RUN_BUFF1=      [XADDR],                ! Address of remainder of buffer
  1         RUN_COUNT=      [XLONG],                ! Records in this run
  1         RUN_RDB=        [XADDR]                 ! List of RDBs in this run
  1         TES;
  1 LITERAL
  1         RUN_K_SIZE=     $FIELD_SET_UNITS;       ! Length in bytes
  1 MACRO
  1         RUN_BLOCK=      %EXPAND $UNIT_BLOCK(RUN_K_SIZE) FIELD(RUN_FIELDS) %;
  1
L 1 %MESSAGE('RUN_K_SIZE = ', %NUMBER(RUN_K_SIZE), ' bytes')
```

```
;  317          0381   1  !                    R U N   D E S C R I P T I O N   B L O C K
;  318          0382   1  !
;  319          0383   1  !
;  320          0384   1  !        This block describes a chunk of mass storage that can be used to hold
;  321          0385   1  !        some blocks of a run.
;  322          0386   1  !
;  323          0387   1  $UNIT_FIELD
;  324          0388   1          RDB_FIELDS=
;  325          0389   1          SET
;  326          0390   1          RDB_NEXT=       [XADDR],                ! Pointer to next RDB block
;  327          0391   1          RDB_WFB=        [XADDR],                ! Pointer to WFB for RDB
;  328          0392   1          RDB_VBN=        [XLONG],                ! VBN of first block in RDB
;  329          0393   1          RDB_SIZE=       [XLONG]                 ! Blocks in this RDB
;  330          0394   1          TES;
;  331          0395   1  LITERAL
;  332          0396   1          RDB_K_SIZE=     $FIELD_SET_UNITS;       ! Length in bytes
;  333          0397   1  MACRO
;  334          0398   1          RDB_BLOCK=      %EXPAND $UNIT_BLOCK(RDB_K_SIZE) FIELD(RDB_FIELDS) %;
;  335          0399   1
;  336        L 0400   1  %MESSAGE('RDB_K_SIZE = ', %NUMBER(RDB_K_SIZE), ' bytes')
;   338          0401  1 $UNIT_FIELD
;   339          0402  1         BUF_FIELDS=
;   340          0403  1         SET
;   341          0404  1         BUF_NEXT=       [XADDR],                        ! Ptr to next free buffer
;   342          0405  1         BUF_ADDR=       [XADDR]                         ! Address of this block
;   343          0406  1         TES;
;   344          0407  1 MACRO   BUF_BLOCK=      %EXPAND $UNIT_BLOCK(0) FIELD(BUF_FIELDS) %;
;   345          0408  1
;   346          0409  1 ! Macroes to insert/remove items into/from a list, at the head/tail
;   347          0410  1 !
;   348        M 0411  1 MACRO   INSLH_(LIST,ITEM,NEXT) =        ! Insert at head of list
;   349        M 0412  1                 BEGIN
;   350        M 0413  1                 ITEM[NEXT] = .LIST;
;   351        M 0414  1                 LIST = ITEM[BASE_];
;   352          0415  1                 END %;
;   353        M 0416  1 MACRO   INSLT_(LIST,ITEM,NEXT) =        ! Insert at tail of list
;   354        M 0417  1                 BEGIN
;   355        M 0418  1                 LOCAL
;   356        M 0419  1                     PPTR: REF VECTOR[1];
;   357        M 0420  1                 PPTR = LIST - BBLOCK[0,NEXT];
;   358        M 0421  1                 WHILE .BBLOCK[PPTR[0],NEXT] NEQ 0 DO
;   359        M 0422  1                     PPTR = .BBLOCK[PPTR[0],NEXT];
;   360        M 0423  1                 BBLOCK[PPTR[0],NEXT] = ITEM[BASE_];
;   361          0424  1                 END %;
;   362        M 0425  1 MACRO   REMLH_(LIST,ITEM,NEXT,ALQ) =    ! Remove from head of list
;   363        M 0426  1                 BEGIN
;   364        M 0427  1                 %IF %NULL(ALQ)
;   365        M 0428  1                 %THEN
;   366        M 0429  1                     IF (ITEM = .LIST) NEQ 0
;   367        M 0430  1                         THEN (LIST = .ITEM[NEXT]; ITEM[NEXT] = 0; TRUE)
;   368        M 0431  1                         ELSE (FALSE)
;   369        M 0432  1                 %ELSE
;   370        M 0433  1                     SOR$$DEALLOCATE(ALQ, LIST, .ITEM[NEXT]);
;   371        M 0434  1                 %FI
;   372          0435  1                 END %;
;  374        0436  1 ROUTINE GET_BUFFER
;  375        0437  1         (
;  376        0438  1         RUNBLOCK:       REF RUN_BLOCK           ! Addr of run description block
;  377        0439  1         ):      CAL_CTXREG NOVALUE =
;  378        0440  1 !++
;  379        0441  1 !
;  380        0442  1 ! FUNCTIONAL DESCRIPTION:
;  381        0443  1 !
;  382        0444  1 !       This routine gets a buffer for the run.
;  383        0445  1 !       It first attempts to get a buffer from the free list of buffers.
;  384        0446  1 !       If this fails, it allocates more memory for the buffer.
;  385        0447  1 !
;  386        0448  1 ! FORMAL PARAMETERS:
;  387        0449  1 !
;  388        0450  1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
;  389        0451  1 !
;  390        0452  1 ! IMPLICIT INPUTS:
;  391        0453  1 !
;  392        0454  1 !       NONE
;  393        0455  1 !
;  394        0456  1 ! IMPLICIT OUTPUTS:
;  395        0457  1 !
;  396        0458  1 !       NONE
;  397        0459  1 !
;  398        0460  1 ! ROUTINE VALUE:
;  399        0461  1 !
;  400        0462  1 !       NONE
;  401        0463  1 !
;  402        0464  1 ! SIDE EFFECTS:
;  403        0465  1 !
;  404        0466  1 !       NONE
;  405        0467  1 !--
;  406        0468  2     BEGIN
;  407        0469  2     EXTERNAL REGISTER
;  408        0470  2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
;  409        0471  2     LOCAL
;  410        0472  2         RUN:    REF RUN_BLOCK;          ! Addr of run description block
;  411        0473  2
;  412        0474  2
;  413        0475  2     ! See whether we already have a buffer
;  414        0476  2     !
;  415        0477  2     RUN = RUNBLOCK[BASE_];
;  416        0478  2     IF .RUN[RUN_BUFFER] EQL 0
;  417        0479  2     THEN
;  418        0480  3         BEGIN
;  419        0481  3         LOCAL
;  420        0482  3             BUFPTR:     REF BUF_BLOCK;  ! Pointer to buffer
;  421        0483  3
;  422        0484  3         ! Remove the buffer from the beginning of the list.
;  423        0485  3         ! If nothing in the list, create a new buffer.
;  424        0486  3         ! Store the address of the buffer
;  425        0487  3         !
;  426        0488  4         IF NOT REMLH_(CTX[S_BUF_FREE], BUFPTR, BUF_NEXT)
;  427        0489  3         THEN
;  428        0490  4             BEGIN
;  429        0491  4             !
;  430        0492  4             ! We want the storage to be aligned on a page boundary.
```

```
 4                      ! Get an extra page, to guarantee sufficient page-aligned pages.
 4                      ! Instead of deallocating the unused portions, they are used to
 4                      ! maintain a linked list of the allocated blocks, using fields
 4                      ! BUF_NEXT and BUF_ADDR.  The field BUF_NEXT is also used in the
 4                      ! page-aligned portion when it is put on the free list.
 4                      !
 4                      LOCAL
 4                          DEL,
 4                          P:        REF BUF_BLOCK,
 4                          STATUS;
 4                      STATUS = LIB$GET_VM(%REF(.CTX[S_BUF_SIZE]+COM_K_BPERPAGE),BUFPTR);
 4                      IF NOT .STATUS
 4                      THEN
 4                          RETURN SOR$$ERROR(SOR$_SHR_SYSERROR, 0, .STATUS);
 4
 4                      ! Determine how much free space is at the beginning.
 4                      !
 4                      DEL = (-.BUFPTR AND (COM_K_BPERPAGE-1));
 4
 4                      ! Put the memory on the S_BUF_ALLOC list
 4                      !
 4                      P = BUFPTR[BASE_];
 4                      IF .DEL LSS 2*%UPVAL           ! Enough room for BUF_NEXT and BUF_ADDR?
 4                      THEN
 4                          P = P[BASE_] + .CTX[S_BUF_SIZE] + 2*%UPVAL;
 4                      P[BUF_ADDR] = BUFPTR[BASE_];
 4                      INSLH_(CTX[S_BUF_ALLOC], P, BUF_NEXT);
 4
 4                      ! Adjust BUFPTR to be page aligned
 4                      !
 4                      BUFPTR = .BUFPTR + .DEL;
 3                      END;
 3
 3                  RUN[RUN_BUFFER] = BUFPTR[BASE_];
 2                  END;
 2
 2              RUN[RUN_BUFF0] = .CTX[S_BUF_SIZE];
 2              RUN[RUN_BUFF1] = .RUN[RUN_BUFFER];
 2
 1              END;


                                                            .TITLE  SOR$SCR_IO
                                                            .IDENT  \V04-000\

                                                            .PSECT  SOR$RO_CODE__________________2,NOWRT,  SHR,  PIC,

                                 00000000V 00000 _CLEAN_UP:
                                                            .LONG   <CLEAN_UP-_CLEAN_UP>                    ;

                                                            .EXTRN  SOR$$BEST_FILE_NAME
                                                            .EXTRN  SOR$$FREE_FILE_NAME
                                                            .EXTRN  SOR$$ALLOCATE, SOR$$DEALLOCATE
                                                            .EXTRN  LIB$GET_EF, LIB$FREE_EF
                                                            .EXTRN  LIB$GET_VM, SOR$$ERROR

                                                            .PSECT  SOR$RO_CODE,NOWRT,  SHR,  PIC,2
```

```
                                                      000C 00000 GET_BUFFER:
                                                                          .WORD   Save R2,R3                                     ; 0436
                                       5E            08 C2 00002          SUBL2   #8, SP                                         ;
                                       52      04    AC D0 00005          MOVL    RUNBLOCK, RUN                                  ; 0477
                                               14    A2 D5 00009          TSTL    20(RUN)                                        ; 0478
                                                     74 12 0000C          BNEQ    5$                                             ;
                                  04   AE    00CC    CB D0 0000E          MOVL    204(CTX), BUFPTR                               ; 0488
                                                     0B 13 00014          BEQL    1$                                             ;
                                00CC   CB      04    BE D0 00016          MOVL    @BUFPTR, 204(CTX)                              ;
                                               04    BE D4 0001C          CLRL    @BUFPTR                                        ;
                                                     5C 11 0001F          BRB     4$                                             ;
                                               04    AE 9F 00021 1$:      PUSHAB  BUFPTR                                         ; 0503
                    04   AE     00D0   CB 00000200   8F C1 00024          ADDL3   #512, 208(CTX), 4(SP)                          ;
                                               04    AE 9F 0002F          PUSHAB  4(SP)                                          ;
                           00000000G   00            02 FB 00032          CALLS   #2, LIB$GET_VM                                 ;
                                       12            50 E8 00039          BLBS    STATUS, 2$                                     ; 0504
                                                     50 DD 0003C          PUSHL   STATUS                                         ; 0506
                                                     7E D4 0003E          CLRL    -(SP)                                          ;
                                          001C11B4   8F DD 00040          PUSHL   #1839540                                       ;
                           00000000G   00            03 FB 00046          CALLS   #3, SOR$$ERROR                                 ;
                                                        04 0004D          RET                                                    ;
                                       50      04    AE CE 0004E 2$:      MNEGL   BUFPTR, R0                                     ; 0510
           53            50            09            00 EF 00052          EXTZV   #0, #9, R0, DEL                                ;
                                       50      04    AE D0 00057          MOVL    BUFPTR, P                                      ; 0514
                                       08            53 D1 0005B          CMPL    DEL, #8                                        ; 0515
                                                     0A 18 0005E          BGEQ    3$                                             ;
                         51            50    00D0    CB C1 00060          ADDL3   208(CTX), P, R1                                ; 0517
                                       50      08    A1 9E 00066          MOVAB   8(R1), P                                       ;
                                  04   A0      04    AE D0 0006A 3$:      MOVL    BUFPTR, 4(P)                                   ; 0518
                                       60    00E8    CB D0 0006F          MOVL    232(CTX), (P)                                  ; 0519
                                00E8   CB            50 D0 00074          MOVL    P, 232(CTX)                                    ;
                                  04   AE            53 C0 00079          ADDL2   DEL, BUFPTR                                    ; 0523
                                  14   A2      04    AE D0 0007D 4$:      MOVL    BUFPTR, 20(RUN)                                ; 0526
                                  18   A2    00D0    CB D0 00082 5$:      MOVL    208(CTX), 24(RUN)                              ; 0529
                                  1C   A2      14    A2 D0 00088          MOVL    20(RUN), 28(RUN)                               ; 0530
                                                        04 0008D          RET                                                    ; 0532

; Routine Size:  142 bytes,    Routine Base:  SOR$RO_CODE + 0000
;  472        0533  1 ROUTINE FREE_BUFFER
;  473        0534  1         (
;  474        0535  1         RUNBLOCK:       REF RUN_BLOCK            ! Addr of run description block
;  475        0536  1         ):      CAL_CTXREG NOVALUE =
;  476        0537  1 !++
;  477        0538  1 !
;  478        0539  1 ! FUNCTIONAL DESCRIPTION:
;  479        0540  1 !
;  480        0541  1 !       This routine puts a buffer on the free list.
;  481        0542  1 !       It also frees the unused portion of RDB connected to the RUN block.
;  482        0543  1 !
;  483        0544  1 ! FORMAL PARAMETERS:
;  484        0545  1 !
;  485        0546  1 !       RUNBLOCK        Address of run description block
;  486        0547  1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
;  487        0548  1 !
;  488        0549  1 ! IMPLICIT INPUTS:
;  489        0550  1 !
;  490        0551  1 !       NONE
;  491        0552  1 !
;  492        0553  1 ! IMPLICIT OUTPUTS:
;  493        0554  1 !
;  494        0555  1 !       NONE
;  495        0556  1 !
;  496        0557  1 ! ROUTINE VALUE:
;  497        0558  1 !
;  498        0559  1 !       NONE
;  499        0560  1 !
;  500        0561  1 ! SIDE EFFECTS:
;  501        0562  1 !
;  502        0563  1 !       NONE
;  503        0564  1 !--
;  504        0565  2     BEGIN
;  505        0566  2     EXTERNAL REGISTER
;  506        0567  2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
;  507        0568  2     LOCAL
;  508        0569  2         BUFPTR: REF BUF_BLOCK,
;  509        0570  2         RUN:    REF RUN_BLOCK;
;  510        0571  2
;  511        0572  2     RUN = RUNBLOCK[BASE_];
;  512        0573  2     BUFPTR = .RUN[RUN_BUFFER];
;  513        0574  2     RUN[RUN_BUFFER] = 0;           ! Not necessary, but by doing this ...
;  514        0575  2     RUN[RUN_BUFF0] = 0;            ! ... an error elsewhere ...
;  515        0576  2     RUN[RUN_BUFF1] = 0;            ! ... should cause an access violation
;  516        0577  2
;  517        0578  2     ! Insert the buffer on the list (at the head)
;  518        0579  2     !
;  519        0580  2     INSLH_(CTX[S_BUF_FREE], BUFPTR, BUF_NEXT);
;  520        0581  2
;  521        0582  2     ! Update the run's current RDB.
;  522        0583  2     ! Put the unused space at the end of the RDB on the WFB_NOUSE list.
;  523        0584  2     !
;  524        0585  3     BEGIN
;  525        0586  3     LOCAL
;  526        0587  3         RDB:    REF RDB_BLOCK;
;  527        0588  3     RDB = .RUN[RUN_RDB_CURR];
;  528        0589  3     IF RDB[BASE_] NEQ 0 THEN
;   529            0590  3      IF .RUN[RUN_VBN] - .RDB[RDB_VBN] LSSU .RDB[RDB_SIZE]
;   530            0591  3      THEN
;   531            0592  4          BEGIN
;   532            0593  4          LOCAL
;   533            0594  4              NEW:            REF RDB_BLOCK;
;   534            0595  4          NEW = SOR$$ALLOCATE(RDB_K_SIZE);
;   535            0596  4          NEW[RDB_WFB]  = .RDB[RDB_WFB];
;   536            0597  4          NEW[RDB_SIZE] = .RDB[RDB_SIZE];
;   537            0598  4          NEW[RDB_VBN]  = .RDB[RDB_VBN];
;   538            0599  4          RDB[RDB_SIZE] = .RUN[RUN_VBN]  - .RDB[RDB_VBN];
;   539            0600  4          NEW[RDB_SIZE] = .NEW[RDB_SIZE] - .RDB[RDB_SIZE];
;   540            0601  4          NEW[RDB_VBN]  = .RDB[RDB_VBN]  + .RDB[RDB_SIZE];
;   541            0602  4          FREE_RDB_(%REF(NEW[BASE_]), WFB_NOUSE);
;   542            0603  3          END;
;   543            0604  2      END;
;   544            0605  2
;   545            0606  1      END;
```

```
                                000C 00000 FREE_BUFFER:
                                                     .WORD   Save R2,R3                        ; 0533
                 5E            04 C2 00002           SUBL2   #4, SP                            ;
                 50         04 AC D0 00005           MOVL    RUNBLOCK, RUN                     ; 0572
                 51         14 A0 D0 00009           MOVL    20(RUN), BUFPTR                   ; 0573
                            14 A0 7C 0000D           CLRQ    20(RUN)                           ; 0574
                            1C A0 D4 00010           CLRL    28(RUN)                           ; 0576
                 61       00CC CB D0 00013           MOVL    204(CTX), (BUFPTR)                ; 0580
               00CC CB         51 D0 00018           MOVL    BUFPTR, 204(CTX)                  ;
                 52         10 A0 D0 0001D           MOVL    16(RUN), RDB                      ; 0588
                               3D 13 00021           BEQL    1$                                ; 0589
     53          08 A0      08 A2 C3 00023           SUBL3   8(RDB), 8(RUN), R3                ; 0590
                 0C A2         53 D1 00029           CMPL    R3, 12(RDB)                       ;
                               31 1E 0002D           BGEQU   1$                                ;
                               10 DD 0002F           PUSHL   #16                               ; 0595
          00000000G 00         01 FB 00031           CALLS   #1, SOR$$ALLOCATE                 ;
                 0C A0      0C A2 D0 00038           MOVL    12(RDB), 12(NEW)                  ; 0597
                 04 A0      04 A2 7D 0003D           MOVQ    4(RDB), 4(NEW)                    ; 0596
                 0C A2         53 D0 00042           MOVL    R3, 12(RDB)                       ; 0599
                 0C A0      0C A2 C2 00046           SUBL2   12(RDB), 12(NEW)                  ; 0600
08   A0          08 A2      0C A2 C1 0004B           ADDL3   12(RDB), 8(RDB), 8(NEW)           ; 0601
                               14 DD 00052           PUSHL   #20                               ; 0602
                 04 AE         50 D0 00054           MOVL    NEW, 4(SP)                        ;
                            04 AE 9F 00058           PUSHAB  4(SP)                             ;
              0000V CF         02 FB 0005B           CALLS   #2, FREE_RDB                      ;
                                  04 00060 1$:       RET                                       ; 0606

; Routine Size:  97 bytes,    Routine Base:  SOR$RO_CODE + 008E
;    547          U 0607   1 %IF %SWITCHES(DEBUG) %THEN
;    548          U 0608   1 GLOBAL ROUTINE DUMP_RDBS(PARAM): CAL_CTXREG =
;    549          U 0609   1     BEGIN
;    550          U 0610   1     EXTERNAL REGISTER
;    551          U 0611   1         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
;    552          U 0612   1     EXTERNAL ROUTINE
;    553          U 0613   1         SOR$$OUTPUT;
;    554          U 0614   1     MACRO
;    555          U 0615   1         DESC_(A) = UPLIT(%CHARCOUNT(A), UPLIT BYTE(A)) %;
;    556          U 0616   1     LOCAL
;    557          U 0617   1         P:        REF RDB_BLOCK;
;    558          U 0618   1     P = .PARAM;
;    559          U 0619   1     WHILE .P NEQ 0 DO
;    560          U 0620   1         BEGIN
;    561          U 0621   1         SOR$$OUTPUT(DESC_(%STRING(
;    562          U 0622   1             '!_!XL:  NEXT!_!XL    WFB!_!XL    VBN!_!XL   SIZE!_!XL')),
;    563          U 0623   1             P[BASE_],
;    564          U 0624   1             .P[RDB_NEXT],
;    565          U 0625   1             .P[RDB_WFB],
;    566          U 0626   1             .P[RDB_VBN],
;    567          U 0627   1             .P[RDB_SIZE]);
;    568          U 0628   1         P = .P[RDB_NEXT];
;    569          U 0629   1         END;
;    570          U 0630   1     RETURN 0;
;    571          U 0631   1     END;
;    572          U 0632   1
;    573          U 0633   1 GLOBAL ROUTINE DUMP_RUNS: CAL_CTXREG =
;    574          U 0634   1     BEGIN
;    575          U 0635   1     EXTERNAL REGISTER
;    576          U 0636   1         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
;    577          U 0637   1     EXTERNAL ROUTINE
;    578          U 0638   1         SOR$$OUTPUT;
;    579          U 0639   1     MACRO
;    580          U 0640   1         DESC_(A) = UPLIT(%CHARCOUNT(A), UPLIT BYTE(A)) %;
;    581          U 0641   1     LOCAL
;    582          U 0642   1         Q:        REF WFB_BLOCK,
;    583          U 0643   1         P:        REF RUN_BLOCK;
;    584          U 0644   1     SOR$$OUTPUT(DESC_('DUMP_RUNS'));
;    585          U 0645   1     P = .CTX[S_RUN_INFO];
;    586          U 0646   1     WHILE .P NEQ 0 DO
;    587          U 0647   1         BEGIN
;    588          U 0648   1         SOR$$OUTPUT(DESC_(%STRING(
;    589          U 0649   1             '!XL:  NEXT!_!XL    DDB!_!XL    VBN!_!XL   SIZE!_!XL!/',
;    590          U 0650   1             '!_ BUFFER!_!XL  BUFF0!_!XL  BUFF1!_!XL  COUNT!_!XL!/',
;    591          U 0651   1             '!_ RDB_CURR!_!XL!/')), P[BASE_],
;    592          U 0652   1             .P[RUN_NEXT], .P[RUN_DDB], .P[RUN_VBN], .P[RUN_SIZE],
;    593          U 0653   1             .P[RUN_BUFFER], .P[RUN_BUFF0], .P[RUN_BUFF1], .P[RUN_COUNT],
;    594          U 0654   1             .P[RUN_RDB_CURR]);
;    595          U 0655   1         DUMP_RDBS(.P[RUN_RDB]);
;    596          U 0656   1         P = .P[RUN_NEXT];
;    597          U 0657   1         END;
;    598          U 0658   1     SOR$$OUTPUT(DESC_('DUMP_WFBS'));
;    599          U 0659   1     Q = .CTX[S_WRK_WFB];
;    600          U 0660   1     WHILE .Q NEQ 0 DO
;    601          U 0661   1         BEGIN
;    602          U 0662   1         SOR$$OUTPUT(DESC_(%STRING(
;    603          U 0663   1             '!XL:    ALQ!_!XL   FREE!_!XL   FULL!_!XL   CHAN!_!XW',
;   604        U 0664   1                       '!/!_   NOUSE!_!XL')),
;   605        U 0665   1                       Q[BASE_],
;   606        U 0666   1                       .Q[WFB_ALQ],
;   607        U 0667   1                       .Q[WFB_FREE],
;   608        U 0668   1                       .Q[WFB_FULL],
;   609        U 0669   1                       .Q[WFB_CHAN],
;   610        U 0670   1                       .Q[WFB_NOUSE]);
;   611        U 0671   1                   DUMP_RDBS(.Q[WFB_FREE]);
;   612        U 0672   1                   DUMP_RDBS(.Q[WFB_FULL]);
;   613        U 0673   1                   DUMP_RUNS(.Q[WFB_NOUSE]);
;   614        U 0674   1                   Q = .Q[WFB_NEXT];
;   615        U 0675   1                   END;
;   616        U 0676   1               RETURN 0;
;   617        U 0677   1               END;
;   618          0678   1 %FI
```

```
1 ROUTINE MRG_WORK_MERGE
1       (
1       CNT,                                            ! Number of runs to find
1       LIST:           REF VECTOR                      ! Counted list of runs to merge
1       ):      CAL_CTXREG NOVALUE =
1 !++
1 !
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       This routine sets up the run information for a merge process.
1 !
1 !       It creates run description blocks for the runs, and allocates buffer
1 !       space for each run.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       CNT             Number of runs to find
1 !       LIST            Counted list of runs to merge (output parameter)
1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
1 !
1 !       The output run is automatically handled by the SOR$$WORK_xxx routines.
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       Status code.
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !--
2     BEGIN
2     EXTERNAL REGISTER
2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
2     LOCAL
2         LST:    REF VECTOR,
2         DDB:    REF DDB_BLOCK,
2         RUN:    REF RUN_BLOCK;          ! Ptr to run block
2
2     ! Zero the count of runs to merge, and the output run.
2     !
2     LST = LIST[0];
2
2
2     ! Calculate the buffer size that will be needed.
2     ! If the record interface is being used on input, this size must include
2     ! both the actual record, and the internal format record.
2     !
2     CTX[S_BUF_SIZE] = .CTX[COM_LRL_INT];
2     DDB = .CTX[COM_INP_DDB];
```

```
IF DDB[BASE_] EQL 0
THEN
    CTX[S_BUF_SIZE] = .CTX[S_BUF_SIZE] + .CTX[COM_LRL];
CTX[S_BUF_SIZE] = ROUND_(.CTX[S_BUF_SIZE], COM_K_BPERPAGE);


! Set up the run description blocks
!
LST[0] = .CNT;
INCR I FROM 1 TO .LST[0] DO
    BEGIN
    !
    ! Allocate another run description block, and link to the list
    !
    RUN = SOR$$ALLOCATE(RUN_K_SIZE);          ! Allocate a new run block
    INSLH_(CTX[S_RUN_INFO], RUN, RUN_NEXT); ! Link this run block into list
    !
    ! Make the run description block reference the DDB
    !       (or the stream number for user-written input routines)
    ! Put a pointer to the run description block into the list
    ! Allocate a buffer for the internal-format records
    !       (only .CTX[COM_LRL_INT] bytes needed for the buffer)
    !
    IF .CTX[COM_INP_DDB] EQL 0
    THEN
        BEGIN
        RUN[RUN_DDB] = .I;                       ! Input stream number
        END
    ELSE
        BEGIN
        RUN[RUN_DDB] = DDB[BASE_];               ! Reference the DDB
        DDB = .DDB[DDB_NEXT];                    ! Advance to next DDB
        END;
    LST[.I] = RUN[BASE_];                        ! Put into the list
    GET_BUFFER(RUN[BASE_]);                      ! Get a buffer for this run
    IF DDB[BASE_] EQL 0
    THEN
        BEGIN
        !
        ! RUN_BUFFER is the address of the internal format record
        ! RUN_BUFF0/1 is the descriptor for the actual record
        !
        ! Note that RUN_BUFF0 is set to the specified LRL value, rather
        ! than the actual amount of space available.  This means that the
        ! buffer passed to the user-written input routine is exactly the
        ! size specified by the LRL.  Also, this does not affect
        ! deallocating the buffer.
        !
        RUN[RUN_BUFF0] = .CTX[COM_LRL];
        RUN[RUN_BUFF1] = .RUN[RUN_BUFF1] + .CTX[COM_LRL_INT];
        END;
    END;

! The output should be counted as another run.
!
CTX[COM_RUNS] = .CTX[COM_RUNS] + 1;          ! One more run batted in
```

```
; 734          0793  1      END;



                                                      003C 00000 MRG_WORK_MERGE:
                                                                        .WORD    Save R2,R3,R4,R5                      ; 0679
                                       55       08  AC  D0 00002        MOVL     LIST, LST                             ; 0727
                                       50     00D0  CB  9E 00006        MOVAB    208(CTX), R0                          ; 0734
                                       60     0088  CB  3C 0000B        MOVZWL   136(CTX), (R0)                        ;
                                       54     009C  CB  D0 00010        MOVL     156(CTX), DDB                         ; 0735
                                                    08  12 00015        BNEQ     1$                                    ; 0736
                                       51     0084  CB  3C 00017        MOVZWL   132(CTX), R1                          ; 0738
                                       60           51  C0 0001C        ADDL2    R1, (R0)                              ;
                        51             60 000001FF  8F  C1 0001F 1$:    ADDL3    #511, (R0), R1                        ; 0739
                        60             51 000001FF  8F  CB 00027        BICL3    #511, R1, (R0)                        ;
                                       65       04  AC  D0 0002F        MOVL     CNT, (LST)                            ; 0744
                                                    53  D4 00033        CLRL     I                                     ; 0745
                                                    47  11 00035        BRB      5$                                    ;
                                                    28  DD 00037 2$:    PUSHL    #40                                   ; 0750
                           00000000G   00           01  FB 00039        CALLS    #1, SOR$$ALLOCATE
                                       52           50  D0 00040        MOVL     R0, RUN
                                       62     00D8  CB  D0 00043        MOVL     216(CTX), (RUN)                       ; 0751
                                00D8   CB           52  D0 00048        MOVL     RUN, 216(CTX)                         ;
                                              009C  CB  D5 0004D        TSTL     156(CTX)                              ; 0759
                                                    06  12 00051        BNEQ     3$                                    ;
                                  04   A2           53  D0 00053        MOVL     I, 4(RUN)                             ; 0762
                                                    07  11 00057        BRB      4$                                    ; 0759
                                  04   A2           54  D0 00059 3$:    MOVL     DDB, 4(RUN)                           ; 0766
                                       54           64  D0 0005D        MOVL     (DDB), DDB                            ; 0767
                                     6543           52  D0 00060 4$:    MOVL     RUN, (LST)[I]                         ; 0769
                                                    52  DD 00064        PUSHL    RUN                                   ; 0770
                                FEA6   CF           01  FB 00066        CALLS    #1, GET_BUFFER
                                                    54  D5 0006B        TSTL     DDB                                   ; 0771
                                                    0F  12 0006D        BNEQ     5$                                    ;
                                  18   A2     0084  CB  3C 0006F        MOVZWL   132(CTX), 24(RUN)                     ; 0784
                                       50     0088  CB  3C 00075        MOVZWL   136(CTX), R0                          ; 0785
                                  1C   A2           50  C0 0007A        ADDL2    R0, 28(RUN)                           ;
                        B5             53           65  F3 0007E 5$:    AOBLEQ   (LST), I, 2$                          ; 0745
                                                7A  AB  B6 00082        INCW     122(CTX)                              ; 0791
                                                        04 00085        RET                                            ; 0793

; Routine Size:  134 bytes,    Routine Base:  SOR$RO_CODE + 00EF
```

```
1 GLOBAL ROUTINE SOR$$WORK_MERGE                       ! Determine runs to merge
1         (
1         CNT,                                         ! Number of runs to find
1         LIST:           REF VECTOR                   ! Counted list of runs to merge
1         ):      CAL_CTXREG NOVALUE =
1 !++
1 !
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       This routine decides which runs to merge.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       CNT             Number of runs to find
1 !       LIST            Counted list of runs to merge (output parameter)
1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
1 !
1 !       The output run is automatically handled by the SOR$$WORK_xxx routines.
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       Status code.
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !
1 !--
2     BEGIN
2     EXTERNAL REGISTER
2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
2     LOCAL
2         LST:    REF VECTOR,
2         RUN:    REF RUN_BLOCK;              ! Ptr to run block
2     MACRO
2         SIZE_(A) = (BIND X = .LST[A]: RUN_BLOCK; .X[RUN_SIZE]) %,
2         SWAP_(X,Y) = (LOCAL Z; Z=.X; X=.Y; Y=.Z) %;
2
2
2     ! If we were invoked for a merge process, call a different routine
2     ! to set up the run information.
2     !
2     IF .CTX[COM_MERGE]
2     THEN
3         BEGIN
3         BUILTIN
3             AP,
3             CALLG;
3         CALLG(.AP, MRG_WORK_MERGE);
3         RETURN;
```

```
;  793          0851  2           END;
;  794          0852  2
;  795          0853  2
;  796          0854  2       ! If there is anything left to be written in the last run,
;  797          0855  2       ! write it out, and free the buffer.
;  798          0856  2       !
;  799          0857  2       RUN = .CTX[S_RUN_CURR];
;  800          0858  2       FLUSH(RUN[BASE_]);
;  801          0859  2       FREE_BUFFER(RUN[BASE_]);
;  802          0860  2
;  803          0861  2
;  804          0862  2       ! Zero the count of runs to merge, and the output run.
;  805          0863  2       !
;  806          0864  2       LST = LIST[0];
;  807          0865  2       LST[0] = 0;
;  808          0866  2
;  809          0867  2
;  810          0868  2       ! Start looking at active runs.
;  811          0869  2       !
;  812          0870  2       RUN = .CTX[S_RUN_INFO];
;  813          0871  2
;  814          0872  2
;  815          0873  2       ! Put the first active runs into the list of runs to be merged,
;  816          0874  2       ! while maintaining LST[1] as the the largest run in the list.
;  817          0875  2       !
;  818          0876  2       DECR I FROM .CNT-1 TO 0 DO
;  819          0877  3           BEGIN
;  820          0878  3           IF RUN[BASE_] EQL 0 THEN EXITLOOP;
;  821          0879  3           LST[0] = .LST[0] + 1;
;  822          0880  3           LST[.LST[0]] = RUN[BASE_];
;  823          0881  3           IF .RUN[RUN_SIZE] GTR SIZE_(1) THEN SWAP_(LST[.LST[0]], LST[1]);
;  824          0882  3           RUN = .RUN[RUN_NEXT];
;  825          0883  2           END;
;  826          0884  2
;  827          0885  2
;  828          0886  2       ! Look through the rest of the active runs, trying to find shorter runs.
;  829          0887  2       ! Since LST[1] is the largest run in the list, we compare with it first.
;  830          0888  2       !
;  831          0889  2       WHILE RUN[BASE_] NEQ 0 DO                               ! While more active runs
;  832          0890  3           BEGIN
;  833          0891  4           IF .RUN[RUN_SIZE] LEQ SIZE_(1)
;  834          0892  3           THEN
;  835          0893  4               BEGIN
;  836          0894  4               LST[1] = RUN[BASE_];                    ! Replace largest with this one
;  837          0895  4               !
;  838          0896  4               ! Put the next largest run into LST[1]
;  839          0897  4               !
;  840          0898  4               DECR I FROM .CNT TO 2 DO
;  841          0899  4                   IF SIZE_(.I) GTR SIZE_(1) THEN SWAP_(LST[.I], LST[1]);
;  842          0900  3               END;
;  843          0901  3           RUN = .RUN[RUN_NEXT];
;  844          0902  2           END;
;  845          0903  2
;  846          0904  2
;  847          0905  2       ! Position to each of the runs, and start reading them.
;  848          0906  2       !
;  849          0907  2       DECR I FROM .LST[0] TO 1 DO POSITION(.LST[.I]);
;  850          0908   2
;  851          0909   2
;  852          0910   2     ! Start a new run, after making sure we really need it
;  853          0911   2     !
;  854          0912   2     IF .LST[0] NEQ 0 THEN NEWRUN();
;  855          0913   2
;  856          0914   2
;  857        L 0915   2     %IF %SWITCHES(DEBUG)
;  858        U 0916   2     %THEN
;  859        U 0917   2         BEGIN
;  860        U 0918   2         EXTERNAL ROUTINE SOR$$OUTPUT;
;  861        U 0919   2         MACRO
;  862        U 0920   2             DESC_(A) = UPLIT(%CHARCOUNT(A), UPLIT BYTE(A)) %;
;  863        U 0921   2         DUMP_RUNS();
;  864        U 0922   2         SOR$$OUTPUT(DESC_('WORK_MERGE'));
;  865        U 0923   2         INCR I FROM 1 TO .LIST[0] DO
;  866        U 0924   2             SOR$$OUTPUT(DESC_('!_Run !XL'), .LIST[.I]);
;  867        U 0925   2         SOR$$OUTPUT(DESC_('!_--> !XL'), .CTX[S_RUN_CURR]);
;  868        U 0926   2         END;
;  869          0927   2     %FI
;  870          0928   2
;  871          0929   2
;  872          0930   1     END;



                                                        003C 00000           .ENTRY   SOR$$WORK_MERGE, Save R2,R3,R4,R5        ; 0794
                                                 5C   AB  95 00002           TSTB     92(CTX)                                  ; 0843
                                                      06  18 00005           BGEQ     1$                                       ;
                                 FF6E   CF            6C  FA 00007           CALLG    (AP), MRG_WORK_MERGE                     ; 0849
                                                          04 0000C           RET                                               ; 0845
                                        53     00D4   CB  D0 0000D 1$:       MOVL     212(CTX), RUN                            ; 0857
                                                      53  DD 00012           PUSHL    RUN                                      ; 0858
                                0000V   CF            01  FB 00014           CALLS    #1, FLUSH                                ;
                                                      53  DD 00019           PUSHL    RUN                                      ; 0859
                                 FEF9   CF            01  FB 0001B           CALLS    #1, FREE_BUFFER                          ;
                                        54       08   AC  D0 00020           MOVL     LIST, LST                                ; 0864
                                                      64  D4 00024           CLRL     (LST)                                    ; 0865
                                        53     00D8   CB  D0 00026           MOVL     216(CTX), RUN                            ; 0870
                                        55       04   A4  9E 0002B           MOVAB    4(LST), R5                               ; 0881
                                        52       04   AC  D0 0002F           MOVL     CNT, I                                   ;
                                                      25  11 00033           BRB      4$                                       ;
                                                      53  D5 00035 2$:       TSTL     RUN                                      ; 0878
                                                      24  13 00037           BEQL     5$                                       ;
                                                      64  D6 00039           INCL     (LST)                                    ; 0879
                                        50            64  D0 0003B           MOVL     (LST), R0                                ; 0880
                                      6440            53  D0 0003E           MOVL     RUN, (LST)[R0]                           ;
                                        51            65  D0 00042           MOVL     (R5), R1                                 ; 0881
                                   0C   A1       0C   A3  D1 00045           CMPL     12(RUN), 12(R1)                          ;
                                                      0B  15 0004A           BLEQ     3$                                       ;
                                        51          6440  D0 0004C           MOVL     (LST)[R0], Z                             ;
                                      6440            65  D0 00050           MOVL     (R5), (LST)[R0]                          ;
                                        65            51  D0 00054           MOVL     Z, (R5)                                  ;
                                        53            63  D0 00057 3$:       MOVL     (RUN), RUN                               ; 0882
                                        D8            52  F4 0005A 4$:       SOBGEQ   I, 2$                                    ; 0876
```

```
                                                  53 D5 0005D 5$:     TSTL    RUN                       ; 0889
                                                  38 13 0005F         BEQL    10$                       ;
                                  50              65 D0 00061         MOVL    (R5), R0                  ; 0891
                            0C    A0      0C      A3 D1 00064         CMPL    12(RUN), 12(R0)           ;
                                                  29 14 00069         BGTR    9$                        ;
                                  65              53 D0 0006B         MOVL    RUN, (R5)                 ; 0894
                                  50      04      AC D0 0006E         MOVL    CNT, I                    ; 0898
                                                  1B 11 00072         BRB     8$                        ;
                                  52            6440 D0 00074 6$:     MOVL    (LST)[I], R2              ; 0899
                                  51              65 D0 00078         MOVL    (R5), R1                  ;
                            0C    A1      0C      A2 D1 0007B         CMPL    12(R2), 12(R1)            ;
                                                  0B 15 00080         BLEQ    7$                        ;
                                  51            6440 D0 00082         MOVL    (LST)[I], Z               ;
                                6440              65 D0 00086         MOVL    (R5), (LST)[I]            ;
                                  65              51 D0 0008A         MOVL    Z, (R5)                   ;
                                                  50 D7 0008D 7$:     DECL    I                         ;
                                  02              50 D1 0008F 8$:     CMPL    I, #2                     ;
                                                  E0 18 00092         BGEQ    6$                        ;
                                  53              63 D0 00094 9$:     MOVL    (RUN), RUN                ; 0901
                                                  C4 11 00097         BRB     5$                        ; 0889
                      53          64              01 C1 00099 10$:    ADDL3   #1, (LST), I              ; 0907
                                                  08 11 0009D         BRB     12$                       ;
                                                6443 DD 0009F 11$:    PUSHL   (LST)[I]                  ;
                         0000V    CF              01 FB 000A2         CALLS   #1, POSITION              ;
                                  F5              53 F5 000A7 12$:    SOBGTR  I, 11$                    ;
                                                  64 D5 000AA         TSTL    (LST)                     ; 0912
                                                  05 13 000AC         BEQL    13$                       ;
                         0000V    CF              00 FB 000AE         CALLS   #0, NEWRUN                ;
                                                     04 000B3 13$:    RET                               ; 0930

; Routine Size:  180 bytes,    Routine Base:  SOR$RO_CODE + 0175
;   874          0931  1 ROUTINE FULL_RDB(STATUS):        CAL_CTXREG NOVALUE =
;   875          0932  2      BEGIN
;   876          0933  2      EXTERNAL REGISTER
;   877          0934  2           CTX =    COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
;   878          0935  2      LOCAL
;   879          0936  2           RUN:     REF RUN_BLOCK,
;   880          0937  2           NEW:     REF RDB_BLOCK,
;   881          0938  2           WFB:     REF WFB_BLOCK,
;   882          0939  2           RDB:     REF RDB_BLOCK;
;   883          0940  2      RUN = .CTX[S_RUN_CURR];
;   884          0941  2      RDB = .RUN[RUN_RDB_CURR];
;   885          0942  2      WFB = .RDB[RDB_WFB];
;   886          0943  2      SOR$$ERROR(SOR$_SHR_WRITEERR, 1, WFB[WFB_NAME], .STATUS);
;   887          0944  2      IF .WFB[WFB_FULL] EQL 0 THEN WFB[WFB_ERRORS] = .WFB[WFB_ERRORS] + 1;
;   888          0945  2      NEW = SOR$$ALLOCATE(RDB_K_SIZE);
;   889          0946  2      NEW[RDB_WFB]  = .RDB[RDB_WFB];
;   890          0947  2      NEW[RDB_SIZE] = .RDB[RDB_SIZE];
;   891          0948  2      NEW[RDB_VBN]  = .RDB[RDB_VBN];
;   892          0949  2      RDB[RDB_SIZE] = .RUN[RUN_VBN]  - .RDB[RDB_VBN];
;   893          0950  2      NEW[RDB_SIZE] = .NEW[RDB_SIZE] - .RDB[RDB_SIZE];
;   894          0951  2      NEW[RDB_VBN]  = .RDB[RDB_VBN]  + .RDB[RDB_SIZE];
;   895          0952  2      INSLH_(WFB[WFB_FULL], NEW, RDB_NEXT);
;   896          0953  2
;   897          0954  2      ! The first time we get errors on this file, it may be due to
;   898          0955  2      ! a failure to extend the work file.
;   899          0956  2      ! The second time may be due to a few bad RDBs, but hopefully the
;   900          0957  2      ! end-of-file RDB is okay (the user may have EXQUOTA privilege).
;   901          0958  2      ! The third time, it's clear that the end-of-file RDB is also bad.
;   902          0959  2      !
;   903          0960  2      ! If the file is that bad, throw the RDBs away.
;   904          0961  2      !
;   905          0962  2      IF .WFB[WFB_ERRORS] GEQ 3
;   906          0963  2      THEN
;   907          0964  2           REMLH_(WFB[WFB_FULL], NEW, RDB_NEXT, RDB_K_SIZE);
;   908          0965  2
;   909          0966  1      END;





                                             001C 00000 FULL_RDB:
                                                                      .WORD    Save R2,R3,R4                                 ; 0931
                   54        00D4    CB   D0 00002                    MOVL     212(CTX), RUN                                 ; 0940
                   52          10    A4   D0 00007                    MOVL     16(RUN), RDB                                  ; 0941
                   53          04    A2   D0 0000B                    MOVL     4(RDB), WFB                                   ; 0942
                               04    AC   DD 0000F                    PUSHL    STATUS                                        ; 0943
                               04    A3   9F 00012                    PUSHAB   4(WFB)                                        ;
                                     01   DD 00015                    PUSHL    #1                                            ;
                         001C10D2    8F   DD 00017                    PUSHL    #1839314                                      ;
           00000000G  00             04   FB 0001D                    CALLS    #4, SOR$$ERROR                                ;
                               18    A3   D5 00024                    TSTL     24(WFB)                                       ; 0944
                                     03   12 00027                    BNEQ     1$                                            ;
                               1C    A3   B6 00029                    INCW     28(WFB)                                       ;
                                     10   DD 0002C 1$:                PUSHL    #16                                           ; 0945
           00000000G  00             01   FB 0002E                    CALLS    #1, SOR$$ALLOCATE                             ;
                  0C  A0           0C    A2   D0 00035                    MOVL     12(RDB), 12(NEW)                              ; 0947
```

```
                         04   A0      04   A2  7D 0003A            MOVQ     4(RDB), 4(NEW)                             ; 0946
          0C   A2        08   A4      08   A2  C3 0003F            SUBL3    8(RDB), 8(RUN), 12(RDB)                    ; 0949
                         0C   A0      0C   A2  C2 00046            SUBL2    12(RDB), 12(NEW)                           ; 0950
          08   A0        08   A2      0C   A2  C1 0004B            ADDL3    12(RDB), 8(RDB), 8(NEW)                    ; 0951
                              60      18   A3  D0 00052            MOVL     24(WFB), (NEW)                             ; 0952
                         18   A3           50  D0 00056            MOVL     NEW, 24(WFB)                               ;
                              03      1C   A3  B1 0005A            CMPW     28(WFB), #3                                ; 0962
                                           0E  1F 0005E            BLSSU    2$                                         ;
                                           60  DD 00060            PUSHL    (NEW)                                      ; 0964
                                      18   A3  9F 00062            PUSHAB   24(WFB)                                    ;
                                           10  DD 00065            PUSHL    #16                                        ;
                    00000000G  00          03  FB 00067            CALLS    #3, SOR$$DEALLOCATE                        ;
                                               04 0006E 2$:        RET                                                 ; 0966

; Routine Size:  111 bytes,    Routine Base:  SOR$RO_CODE + 0229
;  911          0967  1 ROUTINE FILE_EXTEND
;  912          0968  1         (
;  913          0969  1         WFB:     REF WFB_BLOCK,                   ! Work file to extend
;  914          0970  1         EXSZ                                      ! Extension quantity
;  915          0971  1         ):       CAL_CTXREG NOVALUE =
;  916          0972  2     BEGIN
;  917          0973  2     EXTERNAL REGISTER
;  918          0974  2         CTX =    COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
;  919          0975  2     LOCAL
;  920          0976  2         FIB:     BLOCK[FIB$K_EXTDATA, BYTE],      ! File ident block
;  921          0977  2         FIBD:    VECTOR[2],                       ! File ident block descriptor
;  922          0978  2         IOSB:    VECTOR[2],                       ! Virtual addresses
;  923          0979  2         STATUS;
;  924          0980  2
;  925          0981  2     ! Set up the file identification block and its descriptor. Then issue
;  926          0982  2     ! the QIOs which do the extend and write attributes to update the end of
;  927          0983  2     ! file block.
;  928          0984  2     !
;  929          0985  2     CH$FILL (0, FIB$K_EXTDATA, FIB[BASE_]);
;  930          0986  2     FIB[FIB$W_EXCTL] = FIB$M_EXTEND OR FIB$M_ALCONB OR FIB$M_ALDEF;
;  931          0987  2     FIB[FIB$L_EXSZ] = MAXU(.EXSZ, .CTX[S_WRK_DEQ]);
;  932          0988  2
;  933          0989  2     FIBD[0] = FIB$K_EXTDATA;
;  934          0990  2     FIBD[1] = FIB;
;  935          0991  2
;  936        P 0992  2     STATUS = $QIOW(
;  937        P 0993  2         EFN=     .CTX[S_WRK_EFN],
;  938        P 0994  2         CHAN=    .WFB[WFB_CHAN],
;  939        P 0995  2         FUNC=    IO$_MODIFY,
;  940        P 0996  2         P1=      FIBD,
;  941        P 0997  2         IOSB=    IOSB
;  942          0998  2         %IF HOSTILE_ELAN %THEN , ELAN = .CTX[COM_CTXADR] %FI );
;  943          0999  2     IF .STATUS THEN STATUS = .IOSB[0];
;  944          1000  2
;  945          1001  2     IF NOT .STATUS
;  946          1002  2     THEN
;  947          1003  3         BEGIN
;  948          1004  3         !
;  949          1005  3         ! Complain and put remainder of the current RDB on FULL list
;  950          1006  3         !
;  951          1007  3         FULL_RDB(.STATUS);
;  952          1008  3         END
;  953          1009  2     ELSE
;  954          1010  3         BEGIN
;  955          1011  3         !
;  956          1012  3         ! Update the current allocation for this file
;  957          1013  3         !
;  958          1014  3         WFB[WFB_ERRORS] = 0;
;  959          1015  3         WFB[WFB_ALQ] = .FIB[FIB$L_EXSZ] + .FIB[FIB$L_EXVBN];
;  960          1016  2         END;
;  961          1017  1     END;


                                                                .EXTRN  SYS$QIOW

                                            003C 00000 FILE_EXTEND:
```

```
                                                                           .WORD   Save R2,R3,R4,R5                             ; 0967
                                       5E             30  C2 00002         SUBL2   #48, SP                                      ;
           20            00            6E             00  2C 00005         MOVC5   #0, (SP), #0, #32, FIB                       ; 0985
                                                 10   AE     0000A                                                              ;
                                  26   AE        8A   8F  9B 0000C         MOVZBW  #138, FIB+22                                 ; 0986
                                       50        08   AC  D0 00011         MOVL    EXSZ, R0                                     ; 0987
                                00DC   CB             50  D1 00015         CMPL    R0, 220(CTX)                                 ;
                                                      05  1E 0001A         BGEQU   1$                                           ;
                                       50      00DC   CB  D0 0001C         MOVL    220(CTX), R0                                 ;
                                  28   AE             50  D0 00021 1$:     MOVL    R0, FIB+24                                   ;
                                  08   AE             20  D0 00025         MOVL    #32, FIBD                                    ; 0989
                                  0C   AE        10   AE  9E 00029         MOVAB   FIB, FIBD+4                                  ; 0990
                                                      7E  7C 0002E         CLRQ    -(SP)                                        ; 0998
                                                      7E  7C 00030         CLRQ    -(SP)                                        ;
                                                      7E  D4 00032         CLRL    -(SP)                                        ;
                                                 1C   AE  9F 00034         PUSHAB  FIBD                                         ;
                                                      7E  7C 00037         CLRQ    -(SP)                                        ;
                                                 20   AE  9F 00039         PUSHAB  IOSB                                         ;
                                                      36  DD 0003C         PUSHL   #54                                          ;
                                       52        04   AC  D0 0003E         MOVL    WFB, R2                                      ;
                                       7E        1E   A2  3C 00042         MOVZWL  30(R2), -(SP)                                ;
                                               00E0   CB  DD 00046         PUSHL   224(CTX)                                     ;
                            00000000G  00             0C  FB 0004A         CALLS   #12, SYS$QIOW                                ;
                                       06             50  E9 00051         BLBC    STATUS, 2$                                   ; 0999
                                       50             6E  D0 00054         MOVL    IOSB, STATUS                                 ;
                                       08             50  E8 00057         BLBS    STATUS, 3$                                   ; 1001
                                                      50  DD 0005A 2$:     PUSHL   STATUS                                       ; 1007
                                FF30   CF             01  FB 0005C         CALLS   #1, FULL_RDB                                 ;
                                                          04 00061         RET                                                  ; 1001
                                                 1C   A2  B4 00062 3$:     CLRW    28(R2)                                       ; 1014
                    0C   A2       28   AE        2C   AE  C1 00065         ADDL3   FIB+28, FIB+24, 12(R2)                       ; 1015
                                                          04 0006C         RET                                                  ; 1017

; Routine Size:  109 bytes,    Routine Base:  SOR$RO_CODE + 0298
```

```
1 ROUTINE FLUSH                                         ! Flush the buffer for a run
1       (
1       RUNBLOCK:       REF RUN_BLOCK
1       ):      CAL_CTXREG NOVALUE =
1 !++
1 !
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       This routine flushes a buffer.
1 !       Important note: This routine does not update RUN_BUFF1 or RUN_BUFF0.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       RUNBLOCK        Address of the run description block.
1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       NONE
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !--
2     BEGIN
2     EXTERNAL REGISTER
2       CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
2     LOCAL
2       RUN: REF RUN_BLOCK;
2     LOCAL
2       P:      VECTOR[2];
2
2     RUN = RUNBLOCK[BASE_];
2
2     ! Store the number of bytes to write, and the address of the storage
2     !
2     P[0] = ROUND (.RUN[RUN_BUFF1]-.RUN[RUN_BUFFER], COM_K_BPERPAGE);
2     P[1] = .RUN[RUN_BUFFER];
2
2     ! Write out the buffer.
2     !
2     WHILE .P[0] GTR 0 DO
3       BEGIN
3       LOCAL
3           RDB:        REF RDB_BLOCK,
3           WFB:        REF WFB_BLOCK,
3           SIZE;                               ! Number of blocks to write
3
3       ! Compute the number of block we will write
```

```
; 1020          1075  3             !
; 1021          1076  3             RDB = .RUN[RUN_RDB_CURR];
; 1022          1077  3             WFB = .RDB[RDB_WFB];
; 1023          1078  3             SIZE = MINU(
; 1024          1079  3                 .P[0] ^ -LN2 (COM_K_BPERPAGE),
; 1025          1080  3                 .RDB[RDB_VBN] + .RDB[RDB_SIZE] - .RUN[RUN_VBN],
; 1026          1081  3                 127);
; 1027          1082  3             IF
; 1028          1083  3                 .SIZE EQL 0             ! Was this RDB full?
; 1029          1084  3             THEN
; 1030          1085  3                 GET_RDB()               ! Get another RDB to use
; 1031          1086  3             ELIF
; 1032          1087  3                 .RUN[RUN_VBN] + .SIZE GTRU .WFB[WFB_ALQ]
; 1033          1088  3             THEN
; 1034          1089  4                 BEGIN
; 1035          1090  4                 !
; 1036          1091  4                 ! Extend the file
; 1037          1092  4                 !
; 1038          1093  4                 FILE_EXTEND(WFB[BASE_],
; 1039          1094  4                     .RUN[RUN_VBN] + .SIZE - .WFB[WFB_ALQ]);
; 1040          1095  4                 END
; 1041          1096  3             ELSE
; 1042          1097  4                 BEGIN
; 1043          1098  4                 LOCAL
; 1044          1099  4                     IOSB:   VECTOR[4,WORD],
; 1045          1100  4                     STATUS;
; 1046          1101  4                 !
; 1047          1102  4                 ! Actually write some stuff
; 1048          1103  4                 !
; 1049        P 1104  4                 STATUS = $QIOW(
; 1050        P 1105  4                     EFN=    .CTX[S_WRK_EFN],
; 1051        P 1106  4                     CHAN=   .WFB[WFB_CHAN],
; 1052        P 1107  4                     FUNC=   IO$_WRITEVBLK,
; 1053        P 1108  4                     IOSB=   IOSB,
; 1054        P 1109  4                     ASTADR= 0,
; 1055        P 1110  4                     ASTPRM= 0,
; 1056        P 1111  4                     P1=     .P[1],
; 1057        P 1112  4                     P2=     .SIZE ^ LN2 (COM_K_BPERPAGE),
; 1058        P 1113  4                     P3=     .RUN[RUN_VBN]
; 1059          1114  4                     %IF HOSTILE_ELAN %THEN , ELAN = .CTX[COM_CTXADR] %FI );
; 1060          1115  4                 IF .STATUS THEN STATUS = .IOSB[0];
; 1061          1116  4
; 1062          1117  4                 IF NOT .STATUS
; 1063          1118  4                 THEN
; 1064          1119  5                     BEGIN
; 1065          1120  5                     !
; 1066          1121  5                     ! Complain and put remainder of the current RDB on FULL list
; 1067          1122  5                     !
; 1068          1123  5                     FULL_RDB(.STATUS);
; 1069          1124  5                     END
; 1070          1125  4                 ELSE
; 1071          1126  5                     BEGIN
; 1072          1127  5                     !
; 1073          1128  5                     ! Update the next virtual block number to write.
; 1074          1129  5                     ! Update the number of blocks in this run.
; 1075          1130  5                     ! Update blocks read/written since last checkpoint.
; 1076          1131  5                     ! Update the size/address of the buffer to write.
; 1077             1132 5                 !
; 1078             1133 5                 WFB[WFB_ERRORS] = 0;
; 1079             1134 5                 RUN[RUN_VBN]  = .RUN[RUN_VBN]  + .SIZE;
; 1080             1135 5                 RUN[RUN_SIZE] = .RUN[RUN_SIZE] + .SIZE;
; 1081           L 1136 5 %IF FUN_K_CHECKPOINT
; 1082           U 1137 5 %THEN
; 1083           U 1138 5                 CTX[COM_COUNTDOWN] = .CTX[COM_COUNTDOWN] - .SIZE;
; 1084             1139 5 %FI
; 1085             1140 5                 P[0] = .P[0] - .SIZE ^ LN2_(COM_K_BPERPAGE);
; 1086             1141 5                 P[1] = .P[1] + .SIZE ^ LN2_(COM_K_BPERPAGE);
; 1087             1142 4                 END;
; 1088             1143 3             END;
; 1089             1144 2         END;
; 1090             1145 2
; 1091           L 1146 2 %IF FUN_K_CHECKPOINT
; 1092           U 1147 2 %THEN
; 1093           U 1148 2     IF .CTX[COM_COUNTDOWN] LSS 0
; 1094           U 1149 2     THEN
; 1095           U 1150 2         SOR$$CHECKPOINT();
; 1096             1151 2 %FI
; 1097             1152 2
; 1098             1153 1     END;
```

```
                                    003C 00000 FLUSH:   .WORD    Save R2,R3,R4,R5              ; 1018
                    5E            10  C2 00002          SUBL2    #16, SP                       ;
                    52        04  AC  D0 00005          MOVL     RUNBLOCK, RUN                 ; 1058
      50        1C  A2        14  A2  C3 00009          SUBL3    20(RUN), 28(RUN), R0          ; 1062
                    50      01FF  C0  9E 0000F          MOVAB    511(R0), R0                   ;
08    AE            50  000001FF  8F  CB 00014          BICL3    #511, R0, P                   ;
                0C  AE        14  A2  D0 0001D          MOVL     20(RUN), P+4                  ; 1063
                              08  AE  D5 00022 1$:      TSTL     P                             ; 1067
                                  01  14 00025          BGTR     2$                            ;
                                      04 00027          RET                                    ;
                    50        10  A2  D0 00028 2$:      MOVL     16(RUN), RDB                  ; 1076
                    54        04  A0  D0 0002C          MOVL     4(RDB), WFB                   ; 1077
      51        08  AE        F7  8F  78 00030          ASHL     #-9, P, R1                    ; 1079
      50        08  A0        0C  A0  C1 00036          ADDL3    12(RDB), 8(RDB), R0           ; 1080
                    50        08  A2  C2 0003C          SUBL2    8(RUN), R0                    ;
                    50            51  D1 00040          CMPL     R1, R0                        ;
                                  03  1B 00043          BLEQU    3$                            ;
                    51            50  D0 00045          MOVL     R0, R1                        ;
          0000007F  8F            51  D1 00048 3$:      CMPL     R1, #127                      ; 1078
                                  04  1B 0004F          BLEQU    4$                            ;
                    51        7F  8F  9A 00051          MOVZBL   #127, R1                      ;
                    53            51  D0 00055 4$:      MOVL     R1, SIZE                      ;
                                  07  12 00058          BNEQ     6$                            ; 1083
             0000V  CF            00  FB 0005A          CALLS    #0, GET_RDB                   ; 1085
                                  C1  11 0005F 5$:      BRB      1$                            ;
      50            53        08  A2  C1 00061 6$:      ADDL3    8(RUN), SIZE, R0              ; 1087
                0C  A4            50  D1 00066          CMPL     R0, 12(WFB)                   ;
                                  0E  1B 0006A          BLEQU    7$                            ;
      7E            50        0C  A4  C3 0006C          SUBL3    12(WFB), R0, -(SP)            ; 1094
                                  54  DD 00071          PUSHL    WFB                           ; 1093
```

```
                                FF1B  CF           02  FB 00073        CALLS   #2, FILE_EXTEND                     ;
                                                   A8  11 00078        BRB     1$                                  ; 1085
                                                   7E  7C 0007A 7$:    CLRQ    -(SP)                               ; 1114
                                                   7E  D4 0007C        CLRL    -(SP)                               ;
                                              08   A2  DD 0007E        PUSHL   8(RUN)                              ;
                         55           53           09  78 00081        ASHL    #9, SIZE, R5                        ;
                                                   55  DD 00085        PUSHL   R5                                  ;
                                              20   AE  DD 00087        PUSHL   P+4                                 ;
                                                   7E  7C 0008A        CLRQ    -(SP)                               ;
                                              20   AE  9F 0008C        PUSHAB  IOSB                                ;
                                                   30  DD 0008F        PUSHL   #48                                 ;
                                      7E      1E   A4  3C 00091        MOVZWL  30(WFB), -(SP)                      ;
                                            00E0   CB  DD 00095        PUSHL   224(CTX)                            ;
                           00000000G  00           0C  FB 00099        CALLS   #12, SYS$QIOW                       ;
                                      06           50  E9 000A0        BLBC    STATUS, 8$                          ; 1115
                                      50           6E  3C 000A3        MOVZWL  IOSB, STATUS                        ;
                                      09           50  E8 000A6        BLBS    STATUS, 9$                          ; 1117
                                                   50  DD 000A9 8$:    PUSHL   STATUS                              ; 1123
                                FE74  CF           01  FB 000AB        CALLS   #1, FULL_RDB                        ;
                                                   AD  11 000B0        BRB     5$                                  ; 1117
                                              1C   A4  B4 000B2 9$:    CLRW    28(WFB)                             ; 1133
                                  08  A2           53  C0 000B5        ADDL2   SIZE, 8(RUN)                        ; 1134
                                  0C  A2           53  C0 000B9        ADDL2   SIZE, 12(RUN)                       ; 1135
                                  08  AE           55  C2 000BD        SUBL2   R5, P                               ; 1140
                                  0C  AE           55  C0 000C1        ADDL2   R5, P+4                             ; 1141
                                                   98  11 000C5        BRB     5$                                  ; 1067
                                                       04 000C7        RET                                         ; 1153

; Routine Size:  200 bytes,    Routine Base:  SOR$RO_CODE + 0305
; 1100          L 1154  1 %IF FUN_K_CHECKPOINT
; 1101          U 1155  1 %THEN
; 1102          U 1156  1 REQUIRE 'SRC$:CHKPNT';
; 1103            1157  1 %FI
; 1105          1158  1 GLOBAL ROUTINE SOR$$WORK_NEWRUN                      ! Start a new run
; 1106          1159  1         : JSB_NEWRUN NOVALUE =
; 1107          1160  1
; 1108          1161  1 !++
; 1109          1162  1 !
; 1110          1163  1 ! FUNCTIONAL DESCRIPTION:
; 1111          1164  1 !
; 1112          1165  1 !       This routine starts a new run.
; 1113          1166  1 !
; 1114          1167  1 ! FORMAL PARAMETERS:
; 1115          1168  1 !
; 1116          1169  1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
; 1117          1170  1 !
; 1118          1171  1 ! IMPLICIT INPUTS:
; 1119          1172  1 !
; 1120          1173  1 !       NONE
; 1121          1174  1 !
; 1122          1175  1 ! IMPLICIT OUTPUTS:
; 1123          1176  1 !
; 1124          1177  1 !       NONE
; 1125          1178  1 !
; 1126          1179  1 ! ROUTINE VALUE:
; 1127          1180  1 !
; 1128          1181  1 !       NONE
; 1129          1182  1 !
; 1130          1183  1 ! SIDE EFFECTS:
; 1131          1184  1 !
; 1132          1185  1 !       NONE
; 1133          1186  1 !--
; 1134          1187  2     BEGIN
; 1135          1188  2     EXTERNAL REGISTER
; 1136          1189  2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
; 1137          1190  2     LOCAL
; 1138          1191  2         RUN:    REF RUN_BLOCK,
; 1139          1192  2         STATUS;
; 1140          1193  2
; 1141          1194  2     ! See whether there is a current run being processed.
; 1142          1195  2     !
; 1143          1196  2     RUN = .CTX[S_RUN_CURR];
; 1144          1197  2     IF .RUN EQL 0                                  ! Any current run?
; 1145          1198  2     THEN
; 1146          1199  3         BEGIN
; 1147          1200  3         !
; 1148          1201  3         ! No runs yet.  Open scratch files.
; 1149          1202  3         !
; 1150          1203  3         IF .CTX[COM_WRK_FILES] EQL 0
; 1151          1204  3         THEN
; 1152          1205  4             BEGIN
; 1153          1206  4             SOR$$ERROR(SOR$_NO_WRK);                ! We can recover
; 1154          1207  4             CTX[COM_WRK_FILES] = DEF_WORK_FILES;    ! Use some work files
; 1155          1208  3             END;
; 1156          1209  3         WORK_OPEN();                                ! Open the work files
; 1157          1210  3
; 1158        L 1211  3 %IF FUN_K_CHECKPOINT
; 1159        U 1212  3 %THEN
; 1160        U 1213  3         ! Declare a post-checkpoint handler
; 1161        U 1214  3         !
; 1162      U 1215  3          IF CHK$DCLPSH NEQ 0 AND NOT .CTX[COM_NOCHKPNT]
; 1163      U 1216  3          THEN
; 1164      U 1217  3              BEGIN
; 1165      U 1218  3              STATUS = CHK$DCLPSH(PSH_CHECKPOINT, CTX[BASE_], CTX[S_PSH_HANDLER]);
; 1166      U 1219  3              IF .STATUS THEN
; 1167      U 1220  3              STATUS = CHK$DCLRSH(PSH_CHECKPOINT, CTX[BASE_], CTX[S_RSH_HANDLER]);
; 1168      U 1221  3              IF NOT .STATUS
; 1169      U 1222  3              THEN
; 1170      U 1223  3                  BEGIN
; 1171      U 1224  3                  SOR$$ERROR(SOR$_SHR_SYSERROR AND NOT STS$M_SEVERITY OR STS$K_ERROR,
; 1172      U 1225  3                      0, .STATUS);
; 1173      U 1226  3                  CTX[COM_NOCHKPNT] = TRUE;
; 1174      U 1227  3                  END;
; 1175      U 1228  3              END;
; 1176        1229  3 %FI
; 1177        1230  3          END
; 1178        1231  2      ELSE
; 1179        1232  3          BEGIN
; 1180        1233  3          !
; 1181        1234  3          ! There is an outstanding run.  Flush it to the output file,
; 1182        1235  3          ! so we can start the new run on a block boundary.
; 1183        1236  3          !
; 1184        1237  3          FLUSH(RUN[BASE_]);
; 1185        1238  3          FREE_BUFFER(RUN[BASE_]);
; 1186        1239  2          END;
; 1187        1240  2
; 1188        1241  2      !
; 1189        1242  2      ! Start a new run
; 1190        1243  2      !
; 1191        1244  2      NEWRUN();
; 1192        1245  2
; 1193        1246  2      !
; 1194        1247  2      ! From now on, use SOR$$WORK_WRITE to output records
; 1195        1248  2      !
; 1196        1249  2      CTX[COM_OUTPUT] = SOR$$WORK_WRITE;
; 1197        1250  2
; 1198        1251  2
; 1199        1252  2      RETURN SS$_NORMAL;
; 1200        1253  1      END;



                                   52  DD 00000 SOR$$WORK_NEWRUN::
                                                        PUSHL   R2                                 ; 1158
             52       00D4     CB  D0 00002             MOVL    212(CTX), RUN                      ; 1196
                               1D  12 00007             BNEQ    2$                                 ; 1197
                        5A     AB  95 00009             TSTB    90(CTX)                            ; 1203
                               11  12 0000C             BNEQ    1$                                 ;
                  001C8012     8F  DD 0000E             PUSHL   #1867794                           ; 1206
       00000000G  00           01  FB 00014             CALLS   #1, SOR$$ERROR                     ;
              5A  AB           02  90 0001B             MOVB    #2, 90(CTX)                        ; 1207
           0000V  CF           00  FB 0001F 1$:         CALLS   #0, WORK_OPEN                      ; 1209
                               0E  11 00024             BRB     3$                                 ; 1197
                               52  DD 00026 2$:         PUSHL   RUN                                ; 1237
            FF0B  CF           01  FB 00028             CALLS   #1, FLUSH                          ;
```

```
                                        52  DD 0002D          PUSHL   RUN                                  ; 1238
               FC8D   CF                01  FB 0002F          CALLS   #1, FREE_BUFFER                      ;
               0000V  CF                00  FB 00034 3$:      CALLS   #0, NEWRUN                           ; 1244
                 0C   AB      0000V     CF  9E 00039          MOVAB   SOR$$WORK_WRITE, 12(CTX)             ; 1249
                                        04  BA 0003F          POPR    #^M<R2>                              ; 1253
                                            05 00041          RSB                                          ;

; Routine Size:  66 bytes,    Routine Base:  SOR$RO_CODE + 03CD
```

```
  1 ROUTINE GET_RDB: CAL_CTXREG NOVALUE =
  2     BEGIN
  2     EXTERNAL REGISTER
  2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
  2     LOCAL
  2         RUN:    REF RUN_BLOCK,
  2         RDB:    REF RDB_BLOCK,
  2         PREV:   REF VECTOR[1],          ! Ptr to previous
  2         TRIES:  INITIAL(0);
  2     LITERAL
  2         K_TRIES = 3;
  2     LABEL
  2         AGAIN;
  2
  2     ! Find a hole that we can use.
  2     !
  2     WHILE TRUE DO
  3 AGAIN:  BEGIN
  3         LOCAL
  3             MAX_SIZE:   INITIAL(%X'80000000'),  ! Smallest signed longword
  3             WFB:        REF WFB_BLOCK;
  3         LOCAL
  3             ANY_FREE:   INITIAL(0);
  3         MACRO
  3             TRY_AGAIN = LEAVE AGAIN %;
  3
  3         ! Find the largest hole.
  3         !
  3         PREV = 0;
  3         WFB = CTX[S_WRK_WFB] - BBLOCK[0,WFB_NEXT];
  3         WHILE (WFB = .WFB[WFB_NEXT]) NEQ 0 DO           ! For all work files
  4             BEGIN
  4             LOCAL
  4                 CURR_PREV: REF VECTOR[1];
  4             ANY_FREE = .ANY_FREE OR .WFB[WFB_FREE];
  4             CURR_PREV = WFB[WFB_NOUSE];
  4             WHILE (RDB = .CURR_PREV[0]) NEQ 0 DO        ! For RDBs in WFB_NOUSE
  5                 BEGIN
  5                 IF .MAX_SIZE LSS .RDB[RDB_SIZE]
  5                 THEN
  6                     BEGIN
  6                     MAX_SIZE = .RDB[RDB_SIZE];
  6                     PREV = CURR_PREV[0];
  5                     END;
  5                 CURR_PREV = RDB[RDB_NEXT];
  4                 END;
  3             END;
  3
  3
  3         ! Did we find something?
  3         !
  3         IF .MAX_SIZE GTR 0 THEN EXITLOOP;       ! Exit if no extend needed
L 3 %IF FUN_K_CHECKPOINT
U 3 %THEN
U 3         IF NOT .CTX[COM_NOCHKPNT] AND .ANY_FREE NEQ 0
U 3         THEN
U 3             BEGIN
```

```
; 1259      U 1311  3               !
; 1260      U 1312  3               ! Request a checkpoint.  This will cause the RDBs to move
; 1261      U 1313  3               ! from the WFB_FREE list to the WFB_NOUSE list.
; 1262      U 1314  3               !
; 1263      U 1315  3               SOR$$CHECKPOINT();
; 1264      U 1316  3               TRY_AGAIN;
; 1265      U 1317  3               END;
; 1266        1318  3 %FI
; 1267        1319  3         IF PREV[0] NEQ 0 THEN EXITLOOP;         ! Extend as needed
; 1268        1320  3
; 1269        1321  3
; 1270      L 1322  3 %IF FUN_K_ASSIST
; 1271      U 1323  3 %THEN
; 1272      U 1324  3         ! Request operator intervention
; 1273      U 1325  3         !
; 1274      U 1326  3         BEGIN
; 1275      U 1327  3         EXTERNAL ROUTINE
; 1276      U 1328  3             UTIL$ASSIST:            ADDRESSING_MODE(GENERAL);
; 1277      U 1329  3         GLOBAL LITERAL
; 1278      U 1330  3             UTIL$_OPERFAIL = SOR$_OPERFAIL,
; 1279      U 1331  3             UTIL$_OPREPLY  = SOR$_OPREPLY;
; 1280      U 1332  3         LOCAL
; 1281      U 1333  3             REPLY_DESC: VECTOR[2],
; 1282      U 1334  3             REPLY_BUFF: VECTOR[255,BYTE],
; 1283      U 1335  3             STATUS;
; 1284      U 1336  3         REPLY_DESC[0] = %ALLOCATION(REPLY_BUFF);
; 1285      U 1337  3         REPLY_DESC[1] = REPLY_BUFF;
; 1286      U 1338  3         STATUS = UTIL$ASSIST(REPLY_DESC[0],     ! Response
; 1287      U 1339  3             UPLIT(1,                            ! Signal message
; 1288      U 1340  3                 SOR$_EXTEND AND NOT STS$M_SEVERITY OR STS$K_ERROR),
; 1289      U 1341  3             5*60,                               ! Timeout period (in seconds)
; 1290      U 1342  3             UPLIT(1,SOR$_REQ_ALT));             ! Prompt message
; 1291      U 1343  3         IF .STATUS
; 1292      U 1344  3         THEN
; 1293      U 1345  3             BEGIN
; 1294      U 1346  3             TRIES = 0;
; 1295      U 1347  3             IF .REPLY_DESC[0] NEQ 0 THEN WORK_OPEN(REPLY_DESC[0]);
; 1296      U 1348  3             END;
; 1297      U 1349  3         END;
; 1298        1350  3 %FI
; 1299        1351  3         ! Try RDBs that had gotten errors.
; 1300        1352  3         ! Move the RDB's from WFB_FULL to WFB_FREE
; 1301        1353  3         !
; 1302        1354  3         WFB = CTX[S_WRK_WFB] - BBLOCK[0,WFB_NEXT];
; 1303        1355  3         WHILE (WFB = .WFB[WFB_NEXT]) NEQ 0 DO
; 1304        1356  3             MOVE_ALL_RDBS_( WFB[WFB_FULL], WFB_FREE );
; 1305        1357  3
; 1306        1358  3         ! Check how many times we've tried to get more space
; 1307        1359  3         !
; 1308        1360  3         IF (TRIES = .TRIES + 1) LSS K_TRIES THEN TRY_AGAIN;
; 1309        1361  3
; 1310        1362  3         ! At this point, just give up
; 1311        1363  3         !
; 1312        1364  3         SOR$$FATAL(SOR$_EXTEND);
; 1313        1365  2         END;
; 1314        1366  2
; 1315        1367  2     ! Remove the RDB from the free list
; 1316        1368  2     !
; 1317        1369  2     REMLH_(PREV[0], RDB, RDB_NEXT);
; 1318        1370  2
; 1319        1371  2     ! Link the RDB at the end of RDB blocks for the current run.
; 1320        1372  2     !
; 1321        1373  2     RUN = .CTX[S_RUN_CURR];
; 1322        1374  2     INSLT_(RUN[RUN_RDB], RDB, RDB_NEXT);          ! Insert at end of list
; 1323        1375  2
; 1324        1376  2     ! Copy relevant information into the RUN block
; 1325        1377  2     !
; 1326        1378  2     RUN[RUN_RDB_CURR] = RDB[BASE_];
; 1327        1379  2     RUN[RUN_VBN]  = .RDB[RDB_VBN];
; 1328        1380  2
; 1329        1381  1     END;
```

```
                         00FC 00000 GET_RDB:.WORD    Save R2,R3,R4,R5,R6,R7          ; 1254
                       57  D4 00002          CLRL    TRIES                           ; 1255
          51 80000000  8F  D0 00004 1$:      MOVL    #-2147483648, MAX_SIZE          ; 1270
                       55  7C 0000B          CLRQ    PREV                            ; 1282
          54     00E4  CB  9E 0000D          MOVAB   228(R11), R4                    ; 1283
          52           54  D0 00012          MOVL    R4, WFB                         :
          52           62  D0 00015 2$:      MOVL    (WFB), WFB                      ; 1284
                       1F  13 00018          BEQL    5$                              :
          56       10  A2  C8 0001A          BISL2   16(WFB), ANY_FREE               ; 1288
          50       14  A2  9E 0001E          MOVAB   20(R2), CURR_PREV               ; 1289
          53           60  D0 00022 3$:      MOVL    (CURR_PREV), RDB                ; 1290
                       EE  13 00025          BEQL    2$                              :
       0C A3           51  D1 00027          CMPL    MAX_SIZE, 12(RDB)               ; 1292
                       07  18 0002B          BGEQ    4$                              :
          51       0C  A3  D0 0002D          MOVL    12(RDB), MAX_SIZE               ; 1295
          55           50  D0 00031          MOVL    CURR_PREV, PREV                 ; 1296
          50           53  D0 00034 4$:      MOVL    RDB, CURR_PREV                  ; 1298
                       E9  11 00037          BRB     3$                              ; 1290
                       51  D5 00039 5$:      TSTL    MAX_SIZE                        ; 1305
                       32  14 0003B          BGTR    9$                              :
                       55  D5 0003D          TSTL    PREV                            ; 1319
                       2E  12 0003F          BNEQ    9$                              :
          52           54  D0 00041          MOVL    R4, WFB                         ; 1354
          52           62  D0 00044 6$:      MOVL    (WFB), WFB                      ; 1355
                       11  13 00047          BEQL    8$                              :
                   18  A2  D5 00049 7$:      TSTL    24(WFB)                         ; 1356
                       F6  13 0004C          BEQL    6$                              :
                       10  DD 0004E          PUSHL   #16                             :
                   18  A2  9F 00050          PUSHAB  24(WFB)                         :
    0000V CF           02  FB 00053          CALLS   #2, FREE_RDB                    :
                       EF  11 00058          BRB     7$                              :
                       57  D6 0005A 8$:      INCL    TRIES                           ; 1360
          03           57  D1 0005C          CMPL    TRIES, #3                       :
                       A3  19 0005F          BLSS    1$                              :
             001C80A4  8F  DD 00061          PUSHL   #1867940                        ; 1364
00000000G 00           01  FB 00067          CALLS   #1, SOR$$ERROR                  :
                           04 0006E          RET                                     :
          53           65  D0 0006F 9$:      MOVL    (PREV), RDB                     ; 1369
```

```
                        05  13 00072        BEQL    10$                       ;
         65             63  D0 00074        MOVL    (RDB), (PREV)             ;
                        63  D4 00077        CLRL    (RDB)                     ;
         50     00D4    CB  D0 00079 10$:   MOVL    212(CTX), RUN             ; 1373
         51       24    A0  9E 0007E        MOVAB   36(R0), PPTR              ; 1374
                        61  D5 00082 11$:   TSTL    (PPTR)                    ;
                        05  13 00084        BEQL    12$                       ;
         51             61  D0 00086        MOVL    (PPTR), PPTR              ;
                        F7  11 00089        BRB     11$                       ;
         61             53  D0 0008B 12$:   MOVL    RDB, (PPTR)               ;
  10     A0             53  D0 0008E        MOVL    RDB, 16(RUN)              ; 1378
  08     A0       08    A3  D0 00092        MOVL    8(RDB), 8(RUN)            ; 1379
                            04 00097        RET                               ; 1381

; Routine Size:  152 bytes,    Routine Base:  SOR$RO_CODE + 040F
```

```
: 1331          1382  1 ROUTINE FREE_RDB(
: 1332          1383  1         Q:      REF VECTOR[1],
: 1333          1384  1         OFFSET                          ! %FIELDEXPAND(WFB_FREE/NOUSE, 0)
: 1334          1385  1         ): CAL_CTXREG NOVALUE =
: 1335          1386  2     BEGIN
: 1336          1387  2     EXTERNAL REGISTER
: 1337          1388  2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
: 1338          1389  2     LOCAL
: 1339          1390  2         P:      REF RDB_BLOCK,
: 1340          1391  2         R:      REF RDB_BLOCK,
: 1341          1392  2         LOFF;
: 1342          1393  2
: 1343          1394  2     ! Get a pointer to the RDB being freed
: 1344          1395  2     !
: 1345          1396  2     P = .Q[0];
: 1346          1397  2
: 1347          1398  2     ! If we aren't checkpointing, free directly to the WFB_NOUSE list
: 1348          1399  2     !
: 1349        L 1400  2 %IF FUN_K_CHECKPOINT
: 1350        U 1401  2 %THEN
: 1351        U 1402  2     LOFF = .OFFSET;
: 1352        U 1403  2     IF .CTX[COM_NOCHKPNT]
: 1353        U 1404  2     THEN
: 1354          1405  2 %FI
: 1355          1406  2         LOFF = %FIELDEXPAND(WFB_NOUSE,0);
: 1356          1407  2
: 1357          1408  2     ! Hook the RDB onto the WFB's free list
: 1358          1409  2     !
: 1359          1410  2     R = BBLOCK[.P[RDB_WFB],.LOFF,0,%BPVAL,0] - BBLOCK[0,RDB_NEXT];
: 1360          1411  2     WHILE (R = .R[RDB_NEXT]) NEQ 0 DO
: 1361          1412  3         BEGIN
: 1362          1413  3         IF .P[RDB_VBN] + .P[RDB_SIZE] EQL .R[RDB_VBN]
: 1363          1414  3         OR .R[RDB_VBN] + .R[RDB_SIZE] EQL .P[RDB_VBN]
: 1364          1415  3         THEN
: 1365          1416  3             EXITLOOP;
: 1366          1417  3         END;
: 1367          1418  2
: 1368          1419  2     IF R[BASE_] EQL 0
: 1369          1420  2     THEN
: 1370          1421  3         BEGIN
: 1371          1422  3         !
: 1372          1423  3         ! Cannot coalesce the holes
: 1373          1424  3         ! Remove from the current list, and add to the free list
: 1374          1425  3         !
: 1375          1426  3         REMLH_(Q[0], P, RDB_NEXT);
: 1376          1427  3         INSLH_(BBLOCK[.P[RDB_WFB],.LOFF,0,%BPVAL,0], P, RDB_NEXT);
: 1377          1428  3         END
: 1378          1429  2     ELSE
: 1379          1430  3         BEGIN
: 1380          1431  3         !
: 1381          1432  3         ! Coalesce the holes, remove from current list, and deallocate.
: 1382          1433  3         !
: 1383          1434  3         R[RDB_VBN] = MINU(.R[RDB_VBN], .P[RDB_VBN]);
: 1384          1435  3         R[RDB_SIZE] = .P[RDB_SIZE] + .R[RDB_SIZE];
: 1385          1436  3         REMLH_(Q[0], P, RDB_NEXT, RDB_K_SIZE);
: 1386          1437  2         END;
: 1387          1438  2
```

```
; 1388         1439 1     END;



                                  000C 00000 FREE_RDB:
                                                     .WORD   Save R2,R3                      ; 1382
                    50     04   BC  D0 00002         MOVL    @Q, P                           ; 1396
                    53          14  D0 00006         MOVL    #20, LOFF                       ; 1406
          51        53     04   A0  C1 00009         ADDL3   4(P), LOFF, R                   ; 1410
                    51          61  D0 0000E 1$:     MOVL    (R), R                          ; 1411
                                18  13 00011         BEQL    2$                              ;
          52   08   A0     0C   A0  C1 00013         ADDL3   12(P), 8(P), R2                 ; 1413
               08   A1          52  D1 00019         CMPL    R2, 8(R)                        ;
                                0C  13 0001D         BEQL    2$                              ;
          52   08   A1     0C   A1  C1 0001F         ADDL3   12(R), 8(R), R2                 ; 1414
               08   A0          52  D1 00025         CMPL    R2, 8(P)                        ;
                                E3  12 00029         BNEQ    1$                              ;
                                51  D5 0002B 2$:     TSTL    R                               ; 1419
                                1D  12 0002D         BNEQ    4$                              ;
                    50     04   BC  D0 0002F         MOVL    @Q, P                           ; 1426
                                06  13 00033         BEQL    3$                              ;
               04   BC          60  D0 00035         MOVL    (P), @Q                         ;
                                60  D4 00039         CLRL    (P)                             ;
          51        53     04   A0  C1 0003B 3$:     ADDL3   4(P), LOFF, R1                  ; 1427
                    60          61  D0 00040         MOVL    (R1), (P)                       ;
          51        53     04   A0  C1 00043         ADDL3   4(P), LOFF, R1                  ;
                    61          50  D0 00048         MOVL    P, (R1)                         ;
                                    04 0004B         RET                                     ; 1419
                    52     08   A1  D0 0004C 4$:     MOVL    8(R), R2                        ; 1434
               08   A0          52  D1 00050         CMPL    R2, 8(P)                        ;
                                04  1B 00054         BLEQU   5$                              ;
                    52     08   A0  D0 00056         MOVL    8(P), R2                        ;
               08   A1          52  D0 0005A 5$:     MOVL    R2, 8(R)                        ;
               0C   A1     0C   A0  C0 0005E         ADDL2   12(P), 12(R)                    ; 1435
                                60  DD 00063         PUSHL   (P)                             ; 1436
                           04   AC  DD 00065         PUSHL   Q                               ;
                                10  DD 00068         PUSHL   #16                             ;
        00000000G   00          03  FB 0006A         CALLS   #3, SOR$$DEALLOCATE             ;
                                    04 00071         RET                                     ; 1439

; Routine Size:  114 bytes,    Routine Base:  SOR$RO_CODE + 04A7
```

```
1 ROUTINE NEWRUN: CAL_CTXREG NOVALUE =             ! Start a new run
1
1 !++
1 !
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       This routine starts a new run.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       NONE
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !--
2     BEGIN
2     EXTERNAL REGISTER
2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
2     LOCAL
2         RUN:    REF RUN_BLOCK;            ! Ptr to run block
2
2
2     ! Bump the number of runs
2     !
2     CTX[COM_RUNS] = .CTX[COM_RUNS] + 1;         ! One more run batted in
2
2     ! Create a run desription block for this new run.
2     ! Link the new run description block into the list.
2     ! Find a large hole to hold the merged run
2     !
2     RUN = SOR$$ALLOCATE(RUN_K_SIZE);
2     INSLH_(CTX[S_RUN_INFO], RUN, RUN_NEXT);
2     CTX[S_RUN_CURR] = RUN[BASE_];               ! This is the current run
2     RUN[RUN_SIZE] = 0;                          ! Nothing written here yet
2     GET_RDB();
2
2     ! Get a buffer for this run
2     !
2     GET_BUFFER(RUN[BASE_]);
2
1     END;
```

```
                                              0004 00000 NEWRUN: .WORD    Save R2                                ; 1440
                                    7A    AB   B6 00002          INCW     122(CTX)                               ; 1477
                                          28   DD 00005          PUSHL    #40                                    ; 1483
                   00000000G   00         01   FB 00007          CALLS    #1, SOR$$ALLOCATE                      ;
                               52         50   D0 0000E          MOVL     R0, RUN                                ;
                               62   00D8  CB   D0 00011          MOVL     216(CTX), (RUN)                        ; 1484
                      00D8     CB         52   D0 00016          MOVL     RUN, 216(CTX)                          ;
                      00D4     CB         52   D0 0001B          MOVL     RUN, 212(CTX)                          ; 1485
                                    0C    A2   D4 00020          CLRL     12(RUN)                                ; 1486
                      FECE     CF         00   FB 00023          CALLS    #0, GET_RDB                            ; 1487
                                          52   DD 00028          PUSHL    RUN                                    ; 1491
                      FAB8     CF         01   FB 0002A          CALLS    #1, GET_BUFFER                         ;
                                               04 0002F          RET                                             ; 1493

; Routine Size:  48 bytes,    Routine Base:  SOR$RO_CODE + 0519
```

```
1 GLOBAL ROUTINE SOR$$WORK_WRITE           ! Write to a work file
1       (
1       SRC_ADDR:       REF BLOCK         ! Address of internal format record
1       ):      JSB_OUTPUT =
1 !++
1 !
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       This routine writes to a work file.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       SRC_ADDR.ral.v  Address of internal format record
1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       The address of where the record was written.
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !--
2   BEGIN
2   EXTERNAL REGISTER
2       CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
2   LOCAL
2       RUN:    REF RUN_BLOCK,  ! Current run block
2       LEN,                    ! Length of record to write
2       STATUS;                 ! Status
2
2   RUN = .CTX[S_RUN_CURR];
2
2   RUN[RUN_COUNT] = .RUN[RUN_COUNT] + 1;       ! One more record in this run
2
2   !
2   ! Set the length and address of the record to be written.
2   !
2   LEN = .CTX[COM_LRL_INT];
2   IF (RUN[RUN_BUFF0] = .RUN[RUN_BUFF0] - .LEN) GEQ 0
2   THEN
3       BEGIN
3       LOCAL
3           TMP1;
3       CH$MOVE(.LEN, SRC_ADDR[BASE_], .RUN[RUN_BUFF1]);
3       TMP1 = .RUN[RUN_BUFF1];
3       RUN[RUN_BUFF1] = .RUN[RUN_BUFF1] + .LEN;
3       RETURN .TMP1;           ! Return address of the output record
3       END
```

```
; 1502         1551  2        ELSE
; 1503         1552  2            RUN[RUN_BUFF0] = .RUN[RUN_BUFF0] + .LEN;          ! Reset
; 1504         1553  2
; 1505         1554  2
; 1506         1555  2        ! There isn't enough room in the buffer for this record
; 1507         1556  2        !
; 1508         1557  3        BEGIN
; 1509         1558  3        LOCAL
; 1510         1559  3            TMP1,               ! U div BPERPAGE * BPERPAGE
; 1511         1560  3            TMP2,               ! U mod BPERPAGE
; 1512         1561  3            BEND;               ! BUFF0 + BUFF1
; 1513         1562  3
; 1514         1563  3        !+
; 1515         1564  3        ! We want to return the address of the record, so we must have the entire
; 1516         1565  3        ! record available in the buffer.
; 1517         1566  3        !
; 1518         1567  3        ! In the equations below,
; 1519         1568  3        !   U = BUFF1-BUFFER
; 1520         1569  3        ! Write out the first part of the buffer
; 1521         1570  3        !   LEN:    ROUND_(U-BPERPAGE, BPERPAGE)
; 1522         1571  3        !   ADR:    BUFFER
; 1523         1572  3        ! Move the remaining bytes to the beginning of the buffer
; 1524         1573  3        !   SRCLEN: U     -ROUND_(U-BPERPAGE, BPERPAGE)
; 1525         1574  3        !   SRCADR: BUFFER+ROUND_(U-BPERPAGE, BPERPAGE)
; 1526         1575  3        !   DSTLEN: U     -ROUND_(U-BPERPAGE, BPERPAGE)
; 1527         1576  3        !   DSTADR: BUFFER
; 1528         1577  3        ! Move the new record into the buffer
; 1529         1578  3        !   DSTADR: BUFFER+U-ROUND_(U-BPERPAGE, BPERPAGE)
; 1530         1579  3        !-
; 1531         1580  3
; 1532         1581  3        ! Compute ROUND_(U-BPERPAGE, BPERPAGE) and
; 1533         1582  3        !   U - ROUND_(U-BPERPAGE, BPERPAGE)
; 1534         1583  3        !
; 1535         1584  3        TMP1 = .RUN[RUN_BUFF1] - .RUN[RUN_BUFFER];  ! This is momentarily U
; 1536         1585  3        TMP2 = .TMP1 AND     (COM_K_BPERPAGE-1);
; 1537         1586  3        TMP1 = .TMP1 AND NOT (COM_K_BPERPAGE-1);
; 1538         1587  3        BEND = .RUN[RUN_BUFF0] + .RUN[RUN_BUFF1];
; 1539         1588  3
; 1540         1589  3        ! Adjust BUFF0/BUFF1 to indicate a full buffer, and write it out
; 1541         1590  3        !
; 1542         1591  3        RUN[RUN_BUFF1] = .RUN[RUN_BUFFER] + .TMP1;
; 1543         1592  3        RUN[RUN_BUFF0] = 0;
; 1544         1593  3        FLUSH(RUN[BASE_]);
; 1545         1594  3
; 1546         1595  3        ! Move the remaining bytes to the beginning of the buffer
; 1547         1596  3        !
; 1548         1597  3        CH$MOVE(.TMP2, .RUN[RUN_BUFFER] + .TMP1, .RUN[RUN_BUFFER]);
; 1549         1598  3        RUN[RUN_BUFF1] = .RUN[RUN_BUFFER] + .TMP2;
; 1550         1599  3        RUN[RUN_BUFF0] = .BEND - .RUN[RUN_BUFF1];
; 1551         1600  3
; 1552         1601  3        ! Move the new record into the buffer
; 1553         1602  3        !
; 1554         1603  3        CH$MOVE(.LEN, SRC_ADDR[BASE_], .RUN[RUN_BUFF1]);
; 1555         1604  3        TMP1 = .RUN[RUN_BUFF1];
; 1556         1605  3        RUN[RUN_BUFF0] = .RUN[RUN_BUFF0] - .LEN;
; 1557         1606  3        RUN[RUN_BUFF1] = .RUN[RUN_BUFF1] + .LEN;
; 1558         1607  3        RETURN .TMP1;
; 1559          1608  2       END;
; 1560          1609  2
; 1561          1610  1       END;



                                   5E             10  C2 00000 SOR$$WORK_WRITE::
                                                                        SUBL2    #16, SP                                     ; 1494
                                   56       00D4  CB  D0 00003          MOVL     212(CTX), RUN                               ; 1533
                                              20  A6  D6 00008          INCL     32(RUN)                                     ; 1535
                                   7E       0088  CB  3C 0000B          MOVZWL   136(CTX), LEN                               ; 1540
                                              18  A6  9F 00010          PUSHAB   24(RUN)                                     ; 1541
                               00  BE         04  AE  C2 00013          SUBL2    LEN, @0(SP)                                 ;
                                                  11  19 00018          BLSS     1$                                          ;
               1C   B6             6A         04  AE  28 0001A          MOVC3    LEN, (SRC_ADDR), @28(RUN)                   ; 1546
                                   50         1C  A6  D0 00020          MOVL     28(RUN), TMP1                               ; 1547
                               1C  A6         04  AE  C0 00024          ADDL2    LEN, 28(RUN)                                ; 1548
                                                  6C  11 00029          BRB      2$                                          ; 1549
                               00  BE         04  AE  C0 0002B 1$:      ADDL2    LEN, @0(SP)                                 ; 1552
                               08  AE         1C  A6  9E 00030          MOVAB    28(RUN), 8(SP)                              ; 1584
               0C   AE         08  BE         14  A6  C3 00035          SUBL3    20(RUN), @8(SP), TMP1                       ;
10   AE        0C   AE             09             00  EF 0003C          EXTZV    #0, #9, TMP1, TMP2                          ; 1585
                               0C  AE       01FF  8F  AA 00043          BICW2    #511, TMP1                                  ; 1586
               14   AE         00  BE         08  BE  C1 00049          ADDL3    @8(SP), @0(SP), BEND                        ; 1587
               08   BE         14  A6         0C  AE  C1 00050          ADDL3    TMP1, 20(RUN), @8(SP)                       ; 1591
                                              00  BE  D4 00057          CLRL     @0(SP)                                      ; 1592
                                                  56  DD 0005A          PUSHL    RUN                                         ; 1593
                             FD5B  CF             01  FB 0005C          CALLS    #1, FLUSH                                   ;
                    7E         14  A6         0C  AE  C1 00061          ADDL3    TMP1, 20(R6), -(SP)                         ; 1597
               14   B6             9E         14  AE  28 00067          MOVC3    TMP2, @(SP)+, @20(RUN)                      ;
               08   BE         14  A6         10  AE  C1 0006D          ADDL3    TMP2, 20(RUN), @8(SP)                       ; 1598
               00   BE         14  AE         08  BE  C3 00074          SUBL3    @8(SP), BEND, @0(SP)                        ; 1599
                                   56         08  BE  D0 0007B          MOVL     @8(SP), R6                                  ; 1603
                    66             6A         04  AE  28 0007F          MOVC3    LEN, (SRC_ADDR), (R6)                       ;
                               0C  AE         08  BE  D0 00084          MOVL     @8(SP), TMP1                                ; 1604
                               00  BE         04  AE  C2 00089          SUBL2    LEN, @0(SP)                                 ; 1605
                               08  BE         04  AE  C0 0008E          ADDL2    LEN, @8(SP)                                 ; 1606
                                   50         0C  AE  D0 00093          MOVL     TMP1, R0                                    ; 1607
                                   5E             18  C0 00097 2$:      ADDL2    #24, SP                                     ; 1610
                                                      05 0009A          RSB                                                  ;

; Routine Size:  155 bytes,    Routine Base:  SOR$RO_CODE + 0549
; 1563         1611  1 ROUTINE MRG_WORK_READ                ! Read a record for merge
; 1564         1612  1         (
; 1565         1613  1         RUNBLOCK:       REF RUN_BLOCK   ! Address of run description block
; 1566         1614  1         ):      JSB_INPUT =
; 1567         1615  1 !++
; 1568         1616  1 !
; 1569         1617  1 ! FUNCTIONAL DESCRIPTION:
; 1570         1618  1 !
; 1571         1619  1 !       This routine reads a record for a merge, either by
; 1572         1620  1 !       using RMS to get the record, or
; 1573         1621  1 !       calling the user-written input routine.
; 1574         1622  1 !
; 1575         1623  1 ! FORMAL PARAMETERS:
; 1576         1624  1 !
; 1577         1625  1 !       RUNBLOCK        Address of run description block
; 1578         1626  1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
; 1579         1627  1 !
; 1580         1628  1 ! IMPLICIT INPUTS:
; 1581         1629  1 !
; 1582         1630  1 !       NONE
; 1583         1631  1 !
; 1584         1632  1 ! IMPLICIT OUTPUTS:
; 1585         1633  1 !
; 1586         1634  1 !       NONE
; 1587         1635  1 !
; 1588         1636  1 ! ROUTINE VALUE:
; 1589         1637  1 !
; 1590         1638  1 !       Address of record, or zero if end-of-run (end-of-file)
; 1591         1639  1 !
; 1592         1640  1 ! SIDE EFFECTS:
; 1593         1641  1 !
; 1594         1642  1 !       NONE
; 1595         1643  1 !--
; 1596         1644  2     BEGIN
; 1597         1645  2     EXTERNAL REGISTER
; 1598         1646  2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
; 1599         1647  2     BUILTIN
; 1600         1648  2         R0;
; 1601         1649  2     MACRO
; 1602         1650  2         RETURN_ = RETURN R0 = %;
; 1603         1651  2     MACRO
; 1604       M 1652  2         CH$FILL (FILL,DN,DPTR) =
; 1605       M 1653  2             BEGIN
; 1606       M 1654  2             BUILTIN MOVC5;
; 1607       M 1655  2             MOVC5(%REF(0), .R0, %REF(FILL), %REF(DN), DPTR; R0);
; 1608         1656  2             END %;
; 1609         1657  2
; 1610         1658  2     ! Read one record from the file
; 1611         1659  2     !
; 1612         1660  2     WHILE TRUE DO
; 1613         1661  3         BEGIN
; 1614         1662  3         LOCAL
; 1615         1663  3             D:  VECTOR[2];              ! Descriptor
; 1616         1664  3
; 1617         1665  3         ! Grab a pointer to the DDB (if this is a merge with a user-written input
; 1618         1666  3         ! routine, this is really the number of the stream for him to read).
; 1619         1667  3         !
; 1620      1668 3          ! Note that this assignment is inside the loop, because there aren't
; 1621      1669 3          ! any registers that we can use (for DDB) that last across the call
; 1622      1670 3          ! to the input routine.
; 1623      1671 3          !
; 1624      1672 3          REGISTER
; 1625      1673 3              DDB:        REF DDB_BLOCK;          ! Pointer to DDB
; 1626      1674 3          DDB = .RUNBLOCK[RUN_DDB];
; 1627      1675 3
; 1628      1676 3
; 1629      1677 3          ! Clear this, since the user-input routine only stores a word.
; 1630      1678 3          !
; 1631      1679 3          D[0] = 0;
; 1632      1680 3
; 1633      1681 3          IF .CTX[COM_MRG_INPUT] NEQ 0
; 1634      1682 3          THEN
; 1635      1683 4              BEGIN
; 1636      1684 4
; 1637      1685 4              ! If there is a user-written input routine, call it.
; 1638      1686 4              !
; 1639      1687 4              IF .CTX[COM_HACK_2ARGS]
; 1640      1688 4              THEN
; 1641      1689 5                  R0 = (.CTX[COM_MRG_INPUT])
; 1642      1690 4                      (RUNBLOCK[RUN_BUFF0], %REF(.DDB), D[0])
; 1643      1691 4              ELSE
; 1644      1692 5                  R0 = (.CTX[COM_MRG_INPUT])
; 1645      1693 4                      (RUNBLOCK[RUN_BUFF0], %REF(.DDB), D[0], .CTX[COM_CTXADR]);
; 1646      1694 4              IF NOT .R0
; 1647      1695 4              THEN
; 1648      1696 5                  BEGIN
; 1649      1697 5                  IF .R0 NEQ SS$_ENDOFFILE        ! Unexpected error status?
; 1650      1698 5                  THEN
; 1651      1699 5                      R0 = SOR$$ERROR(SOR$_RTNERROR, 0, .R0);
; 1652      1700 5                  RETURN_ DELRUN(RUNBLOCK[BASE_]);        ! Return 0 to indicate EOF
; 1653      1701 4                  END;
; 1654      1702 4              D[1] = .RUNBLOCK[RUN_BUFF1];
; 1655      1703 4              CTX[COM_MRG_STREAM] = .DDB;
; 1656      1704 4              END
; 1657      1705 3          ELSE
; 1658      1706 4              BEGIN
; 1659      1707 4              %IF NOT HOSTILE %THEN
; 1660      1708 4
; 1661      1709 4              ! Clear the VFC area
; 1662      1710 4              !
; 1663      1711 4              IF .CTX[COM_MINVFC] NEQ 0
; 1664      1712 4              THEN
; 1665      1713 4                  CH$FILL_(0, .CTX[COM_MAXVFC], .CTX[COM_RHB_INP]);
; 1666      1714 4
; 1667      1715 4              ! Now get the record
; 1668      1716 4              !
; 1669      1717 4              R0 = $GET(RAB=DDB[DDB_RAB+BASE_]);
; 1670      1718 4
; 1671      1719 4              ! Create a descriptor for the input record
; 1672      1720 4              !
; 1673      1721 4              D[0] = .DDB[DDB_RAB+RAB$W_RSZ];
; 1674      1722 4              D[1] = .DDB[DDB_RAB+RAB$L_RBF];
; 1675      1723 4              CTX[COM_MRG_STREAM] = .DDB[DDB_FIL];
; 1676      1724 4
; 1677      U 1725  4                   %ELSE
; 1678      U 1726  4                   RETURN_ SOR$$ERROR(SOR$_SHR_BADLOGIC);
; 1679        1727  4                   %FI
; 1680        1728  3                   END;
; 1681        1729  3
; 1682        1730  3           IF .R0
; 1683        1731  3           THEN
; 1684        1732  4               BEGIN
; 1685        1733  4
; 1686        1734  4               CTX[COM_INP_RECNUM] = .CTX[COM_INP_RECNUM] + 1;
; 1687        1735  4
; 1688        1736  4               IF
; 1689        1737  5                   BEGIN
; 1690        1738  5                   !
; 1691        1739  5                   ! Check the length
; 1692        1740  5                   !
; 1693        1741  5                   IF .D[0] GTRU .CTX[COM_LRL]
; 1694        1742  5                   THEN
; 1695        1743  6                       BEGIN
; 1696        1744  6                       !
; 1697        1745  6                       ! If too long, complain and shorten the record
; 1698        1746  6                       !
; 1699        1747  6                       R0 = SOR$$ERROR(SOR$_BAD_LRL, 1, .D[0],
; 1700        1748  6                           SOR$_SHR_READERR, 1, DDB[DDB_NAME]);
; 1701        1749  6                       D[0] = .CTX[COM_LRL];
; 1702        1750  6                       TRUE
; 1703        1751  6                       END
; 1704        1752  5                   ELIF .D[0] LSSU .CTX[COM_SRL]
; 1705        1753  5                   THEN
; 1706        1754  6                       BEGIN
; 1707        1755  6                       !
; 1708        1756  6                       ! If too short, complain and ignore the record
; 1709        1757  6                       !
; 1710        1758  6                       R0 = SOR$$ERROR(SOR$_BAD_SRL, 1, .D[0],
; 1711        1759  6                           SOR$_SHR_READERR, 1, DDB[DDB_NAME]);
; 1712        1760  6                       CTX[COM_OMI_RECNUM] = .CTX[COM_OMI_RECNUM] + 1;
; 1713        1761  6                       FALSE
; 1714        1762  6                       END
; 1715        1763  5                   ELSE
; 1716        1764  5                       TRUE
; 1717        1765  5                   END
; 1718        1766  4               THEN
; 1719        1767  5                   BEGIN
; 1720        1768  5                   !
; 1721        1769  5                   ! Convert the record to the internal format, and return the
; 1722        1770  5                   ! address of the internal format record.
; 1723        1771  5                   !
; 1724        1772  6                   IF NOT (R0 = JSB_INPUT(.CTX[COM_INPUT], D[0],
; 1725        1773  6                           .RUNBLOCK[RUN_BUFFER]))
; 1726        1774  5                   THEN
; 1727        1775  5                       CTX[COM_OMI_RECNUM] = .CTX[COM_OMI_RECNUM] + 1
; 1728        1776  5                   ELSE
; 1729        1777  5                       RETURN_ .RUNBLOCK[RUN_BUFFER];
; 1730        1778  4                   END;
; 1731        1779  4               END
; 1732        1780  4           %IF NOT HOSTILE %THEN
; 1733        1781  3           ELIF
; 1734          1782  3             .RO EQL RMS$_RSA                     ! Record Stream Active
; 1735          1783  3         THEN
; 1736          1784  4             RO = $WAIT(RAB=DDB[DDB_RAB+BASE_])   ! Wait until not so active
; 1737          1785  3         ELIF
; 1738          1786  3             .RO EQL RMS$_RLK
; 1739          1787  3         THEN
; 1740          1788  4             BEGIN
; 1741          1789  4             !
; 1742          1790  4             ! Try setting the "read regardless of lock" bit.
; 1743          1791  4             ! If we had already tried that, exit with the error.
; 1744          1792  4             !
; 1745          1793  4             BUILTIN
; 1746          1794  4                 TESTBITSS;
; 1747          1795  4             IF TESTBITSS(DDB[DDB_RAB+RAB$V_RRL]) THEN EXITLOOP;
; 1748          1796  4             RO = SOR$$ERROR(
; 1749          1797  4                 SOR$_SHR_READERR AND NOT STS$M_SEVERITY OR STS$K_WARNING,
; 1750          1798  4                 1, DDB[DDB_NAME],
; 1751          1799  4                 .DDB[DDB_RAB+RAB$L_STS], .DDB[DDB_RAB+RAB$L_STV],
; 1752          1800  4                 RMS$_OK_RRL);
; 1753          1801  4             END
; 1754          1802  4         %FI
; 1755          1803  3         ELSE
; 1756          1804  3             EXITLOOP;                            ! Some other error
; 1757          1805  2         END;
; 1758          1806  2
; 1759          1807  2
; 1760          1808  2     ! Check for the expected status
; 1761          1809  2     !
; 1762          1810  2     IF .RO NEQ RMS$_EOF
; 1763          1811  2     THEN
; 1764          1812  3         BEGIN
; 1765          1813  3         REGISTER
; 1766          1814  3             DDB:          REF DDB_BLOCK;         ! Pointer to DDB
; 1767          1815  3         DDB = .RUNBLOCK[RUN_DDB];
; 1768          1816  3         RO = SOR$$ERROR(SOR$_SHR_READERR, 1, DDB[DDB_NAME],
; 1769          1817  3                 .DDB[DDB_RAB+RAB$L_STS], .DDB[DDB_RAB+RAB$L_STV]);
; 1770          1818  2         END;
; 1771          1819  2
; 1772          1820  2     RETURN_ DELRUN(RUNBLOCK[BASE_]);     ! Return 0
; 1773          1821  1     END;


                                                                           .EXTRN  SYS$GET, SYS$WAIT

                                                      5A  DD 00000 MRG_WORK_READ:
                                                                           PUSHL   R10                                        ; 1611
                                        5E            0C  C2 00002         SUBL2   #12, SP                                      :
                                                      59  DD 00005         PUSHL   R9                                           :
                         51             6E            04  C1 00007 1$:     ADDL3   #4, RUNBLOCK, R1                             ; 1674
                                        56            61  D0 0000B         MOVL    (R1), DDB                                    :
                                                 08   AE  D4 0000E         CLRL    D                                            ; 1679
                                        52       60   AB  D0 00011         MOVL    96(CTX), R2                                  ; 1681
                                                      5A  13 00015         BEQL    6$                                           :
                         59             6E            18  C1 00017         ADDL3   #24, RUNBLOCK, R9                            ; 1690
                         11        5C   AB            05  E1 0001B         BBC     #5, 92(CTX), 2$                              ; 1687
                                                 08   AE  9F 00020         PUSHAB  D                                            ; 1690
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                               08  AE               56  D0 00023         MOVL    DDB, 8(SP)                               ;
                                                08  AE  9F 00027         PUSHAB  8(SP)                                    ;
                                                    59  DD 0002A         PUSHL   R9                                       ;
                                   62               03  FB 0002C         CALLS   #3, (R2)                                 ;
                                                    12  11 0002F         BRB     3$                                       ; 1689
                                                54  AB  DD 00031 2$:     PUSHL   84(CTX)                                  ; 1693
                                                0C  AE  9F 00034         PUSHAB  D                                        ;
                               0C  AE               56  D0 00037         MOVL    DDB, 12(SP)                              ;
                                                0C  AE  9F 0003B         PUSHAB  12(SP)                                   ;
                                                    59  DD 0003E         PUSHL   R9                                       ;
                                   62               04  FB 00040         CALLS   #4, (R2)                                 ;
                                   1D               50  E8 00043 3$:     BLBS    R0, 5$                                   ; 1694
                         00000870  8F               50  D1 00046         CMPL    R0, #2160                                ; 1697
                                                    11  13 0004D         BEQL    4$                                       ;
                                                    50  DD 0004F         PUSHL   R0                                       ; 1699
                                                    7E  D4 00051         CLRL    -(SP)                                    ;
                                          001C812A  8F  DD 00053         PUSHL   #1868074                                 ;
                        00000000G  00               03  FB 00059         CALLS   #3, SOR$$ERROR                           ;
                                              0120  31 00060 4$:     BRW     17$                                      ; 1700
                    51             6E               1C  C1 00063 5$:     ADDL3   #28, RUNBLOCK, R1                        ; 1702
                               0C  AE               61  D0 00067         MOVL    (R1), D+4                                ;
                               64  AB               56  D0 0006B         MOVL    DDB, 100(CTX)                            ; 1703
                                                    2C  11 0006F         BRB     8$                                       ; 1681
                                              0081  CB  95 00071 6$:     TSTB    129(CTX)                                 ; 1711
                                                    0D  13 00075         BEQL    7$                                       ;
                                   51         0082  CB  9A 00077         MOVZBL  130(CTX), R1                             ; 1713
      51            00             60               00  2C 0007C         MOVC5   #0, (R0), #0, R1, @140(CTX)              ;
                                              008C  DB     00081                                                          ;
                                                14  A6  9F 00084 7$:     PUSHAB  20(DDB)                                  ; 1717
                        00000000G  00               01  FB 00087         CALLS   #1, SYS$GET                              ;
                               08  AE           36  A6  3C 0008E         MOVZWL  54(DDB), D                               ; 1721
                               0C  AE           3C  A6  D0 00093         MOVL    60(DDB), D+4                             ; 1722
                               64  AB           58  A6  9A 00098         MOVZBL  88(DDB), 100(CTX)                        ; 1723
                                   7B               50  E9 0009D 8$:     BLBC    R0, 13$                                  ; 1730
                                                7C  AB  D6 000A0         INCL    124(CTX)                                 ; 1734
08    AE     0084   CB             10               00  ED 000A3         CMPZV   #0, #16, 132(CTX), D                     ; 1741
                                                    25  1E 000AB         BGEQU   9$                                       ;
                                                04  A6  9F 000AD         PUSHAB  4(DDB)                                   ; 1748
                                                    01  DD 000B0         PUSHL   #1                                       ;
                                          001C10B2  8F  DD 000B2         PUSHL   #1839282                                 ;
                                                14  AE  DD 000B8         PUSHL   D                                        ;
                                                    01  DD 000BB         PUSHL   #1                                       ;
                                          001C8082  8F  DD 000BD         PUSHL   #1867906                                 ;
                        00000000G  00               06  FB 000C3         CALLS   #6, SOR$$ERROR                           ;
                               08  AE         0084  CB  3C 000CA         MOVZWL  132(CTX), D                              ; 1749
                                                    29  11 000D0         BRB     10$                                      ;
08    AE     0086   CB             10               00  ED 000D2 9$:     CMPZV   #0, #16, 134(CTX), D                     ; 1752
                                                    1F  1B 000DA         BLEQU   10$                                      ;
                                                04  A6  9F 000DC         PUSHAB  4(DDB)                                   ; 1759
                                                    01  DD 000DF         PUSHL   #1                                       ;
                                          001C10B2  8F  DD 000E1         PUSHL   #1839282                                 ;
                                                14  AE  DD 000E7         PUSHL   D                                        ;
                                                    01  DD 000EA         PUSHL   #1                                       ;
                                          001C80F8  8F  DD 000EC         PUSHL   #1868024                                 ;
                        00000000G  00               06  FB 000F2         CALLS   #6, SOR$$ERROR                           ;
                                                    11  11 000F9         BRB     11$                                      ; 1760
                                   59           08  AE  9E 000FB 10$:    MOVAB   D, R9                                    ; 1772
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          7E                6E              14 C1 000FF         ADDL3   #20, RUNBLOCK, -(SP)                    ;
                            5A              9E D0 00103         MOVL    @(SP)+, R10                             ;
                                        08  BB 16 00106         JSB     @8(CTX)                                 ;
                            06              50 E8 00109         BLBS    R0, 12$                                 ;
                                      00BC  CB D6 0010C 11$:    INCL    188(CTX)                                ; 1775
                                            48 11 00110         BRB     15$                                     ;
          51                6E              14 C1 00112 12$:    ADDL3   #20, RUNBLOCK, R1                       ; 1777
                            50              61 D0 00116         MOVL    (R1), R0                                ;
                                            6F 11 00119         BRB     18$                                     ; 1776
              000182DA      8F              50 D1 0011B 13$:    CMPL    R0, #99034                              ; 1782
                                            0C 12 00122         BNEQ    14$                                     ;
                                        14  A6 9F 00124         PUSHAB  20(DDB)                                 ; 1784
             00000000G      00              01 FB 00127         CALLS   #1, SYS$WAIT                            ;
                                            2A 11 0012E         BRB     15$                                     ;
              000182AA      8F              50 D1 00130 14$:    CMPL    R0, #98986                              ; 1786
                                            24 12 00137         BNEQ    16$                                     ;
          1F        18      A6              03 E2 00139         BBSS    #3, 24(DDB), 16$                        ; 1795
                                  00018029  8F DD 0013E         PUSHL   #98345                                  ; 1798
                            7E          1C  A6 7D 00144         MOVQ    28(DDB), -(SP)                          ; 1799
                                        04  A6 9F 00148         PUSHAB  4(DDB)                                  ; 1798
                                            01 DD 0014B         PUSHL   #1                                      ;
                                  001C10B0  8F DD 0014D         PUSHL   #1839280                                ;
             00000000G      00              06 FB 00153         CALLS   #6, SOR$$ERROR                          ;
                                          FEAA 31 0015A 15$:    BRW     1$                                      ; 1784
              0001827A      8F              50 D1 0015D 16$:    CMPL    R0, #98938                              ; 1810
                                            1D 13 00164         BEQL    17$                                     ;
          52                6E              04 C1 00166         ADDL3   #4, RUNBLOCK, R2                        ; 1815
                            51              62 D0 0016A         MOVL    (R2), DDB                               ;
                            7E          1C  A1 7D 0016D         MOVQ    28(DDB), -(SP)                          ; 1817
                                        04  A1 9F 00171         PUSHAB  4(DDB)                                  ; 1816
                                            01 DD 00174         PUSHL   #1                                      ;
                                  001C10B2  8F DD 00176         PUSHL   #1839282                                ;
             00000000G      00              05 FB 0017C         CALLS   #5, SOR$$ERROR                          ;
                                            6E DD 00183 17$:    PUSHL   RUNBLOCK                                ; 1820
                 0000V      CF              01 FB 00185         CALLS   #1, DELRUN                              ;
                            5E              10 C0 0018A 18$:    ADDL2   #16, SP                                 ; 1821
                            5A              8E D0 0018D         MOVL    (SP)+, R10                              ;
                                               05 00190         RSB                                             ;

; Routine Size:  401 bytes,    Routine Base:  SOR$RO_CODE + 05E4
; 1775          1822  1 ROUTINE FILL                            ! Read from a scratch file
; 1776          1823  1         (
; 1777          1824  1         RUNBLOCK:       REF RUN_BLOCK,  ! Address of run description block
; 1778          1825  1         P:              REF VECTOR[2]   ! Length/address
; 1779          1826  1         ):      JSB_INPUT =
; 1780          1827  2     BEGIN
; 1781          1828  2     EXTERNAL REGISTER
; 1782          1829  2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
; 1783          1830  2     LOCAL
; 1784          1831  2         RUN:    REF RUN_BLOCK;
; 1785          1832  2     LOCAL
; 1786          1833  2         IOSB:   VECTOR[4,WORD];
; 1787          1834  2
; 1788          1835  2     RUN = RUNBLOCK[BASE_];
; 1789          1836  2
; 1790          1837  2     WHILE .P[0] GTR 0 DO
; 1791          1838  3         BEGIN
; 1792          1839  3         LOCAL
; 1793          1840  3             RDB:            REF RDB_BLOCK,
; 1794          1841  3             WFB:            REF WFB_BLOCK,
; 1795          1842  3             SIZE;                       ! Number of blocks to write
; 1796          1843  3
; 1797          1844  3         ! Compute the number of blocks we will read
; 1798          1845  3         !
; 1799          1846  3         RDB = .RUN[RUN_RDB_CURR];
; 1800          1847  3         WFB = .RDB[RDB_WFB];
; 1801          1848  3         SIZE = MINU(
; 1802          1849  3             .P[0] ^ -LN2 (COM_K_BPERPAGE),
; 1803          1850  3             .RDB[RDB_VBN] + .RDB[RDB_SIZE] - .RUN[RUN_VBN],
; 1804          1851  3             127);
; 1805          1852  3         IF
; 1806          1853  3             .SIZE EQL 0         ! Was this RDB depleted?
; 1807          1854  3         THEN
; 1808          1855  4             BEGIN
; 1809          1856  4             FREE_RDB (RUN[RUN_RDB], WFB_FREE);
; 1810          1857  4             RUN[RUN_RDB_CURR] = .RUN[RUN_RDB];
; 1811          1858  4             RDB = .RUN[RUN_RDB_CURR];
; 1812          1859  4             IF RDB[BASE_] EQL 0 THEN EXITLOOP;
; 1813          1860  4             RUN[RUN_VBN] = .RDB[RDB_VBN];
; 1814          1861  4             END
; 1815          1862  3         ELSE
; 1816          1863  4             BEGIN
; 1817          1864  4             LOCAL
; 1818          1865  4                 STATUS;
; 1819          1866  4
; 1820        P 1867  4             STATUS = $QIOW(
; 1821        P 1868  4                 EFN=    .CTX[S_WRK_EFN],
; 1822        P 1869  4                 CHAN=   .WFB[WFB_CHAN],
; 1823        P 1870  4                 FUNC=   IO$_READVBLK,
; 1824        P 1871  4                 IOSB=   IOSB,
; 1825        P 1872  4                 ASTADR= 0,
; 1826        P 1873  4                 ASTPRM= 0,
; 1827        P 1874  4                 P1=     .P[1],
; 1828        P 1875  4                 P2=     .SIZE ^ LN2 (COM_K_BPERPAGE),
; 1829        P 1876  4                 P3=     .RUN[RUN_VBN]
; 1830          1877  4                 %IF HOSTILE_ELAN %THEN , ELAN = .CTX[COM_CTXADR] %FI );
; 1831          1878  4             IF .STATUS THEN STATUS = .IOSB[0];
; 1832          1879  4
; 1833          1880  4                IF NOT .STATUS
; 1834          1881  4                THEN
; 1835          1882  5                    BEGIN
; 1836          1883  5                    RETURN SOR$$ERROR(SOR$_SHR_READERR, 1, WFB[WFB_NAME], .STATUS);
; 1837          1884  5                    END
; 1838          1885  4                ELSE
; 1839          1886  5                    BEGIN
; 1840          1887  5                    !
; 1841          1888  5                    ! Update the next virtual block number to read.
; 1842          1889  5                    ! Update blocks read/written since last checkpoint.
; 1843          1890  5                    ! Update the size/address of the buffer to write
; 1844          1891  5                    !
; 1845          1892  5                    RUN[RUN_VBN]  = .RUN[RUN_VBN]  + .SIZE;
; 1846        L 1893  5 %IF FUN_K_CHECKPOINT
; 1847        U 1894  5 %THEN
; 1848        U 1895  5                    CTX[COM_COUNTDOWN] = .CTX[COM_COUNTDOWN] - .SIZE;
; 1849          1896  5 %FI
; 1850          1897  5                    P[0] = .P[0] - .SIZE ^ LN2_(COM_K_BPERPAGE);
; 1851          1898  5                    P[1] = .P[1] + .SIZE ^ LN2_(COM_K_BPERPAGE);
; 1852          1899  4                    END;
; 1853          1900  3                END;
; 1854          1901  2            END;
; 1855          1902  2
; 1856        L 1903  2 %IF FUN_K_CHECKPOINT
; 1857        U 1904  2 %THEN
; 1858        U 1905  2      IF .CTX[COM_COUNTDOWN] LSS 0
; 1859        U 1906  2      THEN
; 1860        U 1907  2          SOR$$CHECKPOINT();
; 1861          1908  2 %FI
; 1862          1909  2
; 1863          1910  2      RETURN SS$_NORMAL;
; 1864          1911  1      END;




                                      5A  DD 00000 FILL:   PUSHL   R10                                  ; 1822
                   5E                 08  C2 00002         SUBL2   #8, SP                               ;
                   54                 59  7D 00005         MOVQ    RUNBLOCK, RUN                        ; 1835
                                      65  D5 00008 1$:     TSTL    (P)                                  ; 1837
                                      03  14 0000A         BGTR    2$                                   ;
                                    009F  31 0000C         BRW     9$                                   ;
                   52          10     A4  D0 0000F 2$:     MOVL    16(RUN), RDB                         ; 1846
                   56          04     A2  D0 00013         MOVL    4(RDB), WFB                          ; 1847
 5A                65          F7     8F  78 00017         ASHL    #-9, (P), R10                        ; 1849
 50        08      A2          0C     A2  C1 0001C         ADDL3   12(RDB), 8(RDB), R0                  ; 1850
                   50          08     A4  C2 00022         SUBL2   8(RUN), R0                           ;
                   50                 5A  D1 00026         CMPL    R10, R0                              ;
                                      03  1B 00029         BLEQU   3$                                   ;
                   5A                 50  D0 0002B         MOVL    R0, R10                              ;
        0000007F   8F                 5A  D1 0002E 3$:     CMPL    R10, #127                            ; 1848
                                      04  1B 00035         BLEQU   4$                                   ;
                   5A          7F     8F  9A 00037         MOVZBL  #127, R10                            ;
                   53                 5A  D0 0003B 4$:     MOVL    R10, SIZE                            ;
                                      1C  12 0003E         BNEQ    6$                                   ; 1853
```

```
                                                          10  DD 00040         PUSHL   #16                     ; 1856
                                                  24      A4  9F 00042         PUSHAB  36(RUN)                 ;
                                    FCE8  CF              02  FB 00045         CALLS   #2, FREE_RDB            ;
                                      10  A4      24      A4  D0 0004A         MOVL    36(RUN), 16(RUN)        ; 1857
                                          52      10      A4  D0 0004F         MOVL    16(RUN), RDB            ; 1858
                                                          59  13 00053         BEQL    9$                      ; 1859
                                      08  A4      08      A2  D0 00055         MOVL    8(RDB), 8(RUN)          ; 1860
                                                          AC  11 0005A 5$:     BRB     1$                      ; 1852
                                                          7E  7C 0005C 6$:     CLRQ    -(SP)                   ; 1877
                                                          7E  D4 0005E         CLRL    -(SP)                   ;
                                                  08      A4  DD 00060         PUSHL   8(RUN)                  ;
                           52             53              09  78 00063         ASHL    #9, SIZE, R2            ;
                                                          52  DD 00067         PUSHL   R2                      ;
                                                  04      A5  DD 00069         PUSHL   4(P)                    ;
                                                          7E  7C 0006C         CLRQ    -(SP)                   ;
                                                  20      AE  9F 0006E         PUSHAB  IOSB                    ;
                                                          31  DD 00071         PUSHL   #49                     ;
                                          7E      1E      A6  3C 00073         MOVZWL  30(WFB), -(SP)          ;
                                                00E0      CB  DD 00077         PUSHL   224(CTX)                ;
                               00000000G  00              0C  FB 0007B         CALLS   #12, SYS$QIOW           ;
                                          06              50  E9 00082         BLBC    STATUS, 7$              ; 1878
                                          50              6E  3C 00085         MOVZWL  IOSB, STATUS            ;
                                          16              50  E8 00088         BLBS    STATUS, 8$              ; 1880
                                                          50  DD 0008B 7$:     PUSHL   STATUS                  ; 1883
                                                  04      A6  9F 0008D         PUSHAB  4(WFB)                  ;
                                                          01  DD 00090         PUSHL   #1                      ;
                                            001C10B2      8F  DD 00092         PUSHL   #1839282                ;
                               00000000G  00              04  FB 00098         CALLS   #4, SOR$$ERROR          ;
                                                          10  11 0009F         BRB     10$                     ;
                                      08  A4              53  C0 000A1 8$:     ADDL2   SIZE, 8(RUN)            ; 1892
                                          65              52  C2 000A5         SUBL2   R2, (P)                 ; 1897
                                      04  A5              52  C0 000A8         ADDL2   R2, 4(P)                ; 1898
                                                          AC  11 000AC         BRB     5$                      ; 1837
                                          50              01  D0 000AE 9$:     MOVL    #1, R0                  ; 1910
                                          5E              08  C0 000B1 10$:    ADDL2   #8, SP                  ; 1911
                                          5A              8E  D0 000B4         MOVL    (SP)+, R10              ;
                                                              05 000B7         RSB                             ;

; Routine Size:  184 bytes,    Routine Base:  SOR$RO_CODE + 0775
; 1866          1912  1 GLOBAL ROUTINE SOR$$WORK_READ            ! Read from a work file
; 1867          1913  1         (
; 1868          1914  1         RUNBLOCK:       REF RUN_BLOCK   ! Address of run description block
; 1869          1915  1         ):      JSB_INPUT =
; 1870          1916  1 !++
; 1871          1917  1 !
; 1872          1918  1 ! FUNCTIONAL DESCRIPTION:
; 1873          1919  1 !
; 1874          1920  1 !       This routine reads from a work file.
; 1875          1921  1 !
; 1876          1922  1 ! FORMAL PARAMETERS:
; 1877          1923  1 !
; 1878          1924  1 !       RUNBLOCK        Address of run description block
; 1879          1925  1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
; 1880          1926  1 !
; 1881          1927  1 ! IMPLICIT INPUTS:
; 1882          1928  1 !
; 1883          1929  1 !       NONE
; 1884          1930  1 !
; 1885          1931  1 ! IMPLICIT OUTPUTS:
; 1886          1932  1 !
; 1887          1933  1 !       NONE
; 1888          1934  1 !
; 1889          1935  1 ! ROUTINE VALUE:
; 1890          1936  1 !
; 1891          1937  1 !       Address of record, or zero if end-of-run.
; 1892          1938  1 !
; 1893          1939  1 ! SIDE EFFECTS:
; 1894          1940  1 !
; 1895          1941  1 !       NONE
; 1896          1942  1 !--
; 1897          1943  2     BEGIN
; 1898          1944  2     EXTERNAL REGISTER
; 1899          1945  2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
; 1900          1946  2     LOCAL
; 1901          1947  2         RUN:    REF RUN_BLOCK,
; 1902          1948  2         LEN;                                    ! Length of record
; 1903          1949  2     LOCAL
; 1904          1950  2         IOSB:   VECTOR[4,WORD];
; 1905          1951  2
; 1906          1952  2     RUN = RUNBLOCK[BASE_];
; 1907          1953  2
; 1908          1954  2
; 1909          1955  2     ! If we were invoked for a merge, call MRG_WORK_READ to get the record
; 1910          1956  2     !
; 1911          1957  2     IF .CTX[COM_MERGE]
; 1912          1958  2     THEN
; 1913          1959  2         RETURN MRG_WORK_READ(RUN[BASE_]);
; 1914          1960  2
; 1915          1961  2
; 1916          1962  2     RUN[RUN_COUNT] = .RUN[RUN_COUNT] - 1;       ! One less record
; 1917          1963  2     IF .RUN[RUN_COUNT] LSS 0
; 1918          1964  2     THEN
; 1919          1965  2         RETURN DELRUN(RUN[BASE_]);              ! Return now if no more records
; 1920          1966  2
; 1921          1967  2
; 1922          1968  2     ! Set the length of the record to be read.
```

```
2        !
2        LEN = .CTX[COM_LRL_INT];
2
2
2        ! If everything fine, return now with the address of the record.
2        !
2        IF (RUN[RUN_BUFF0] = .RUN[RUN_BUFF0] - .LEN) GEQ 0
2        THEN
3            BEGIN
3            RUN[RUN_BUFF1] = .RUN[RUN_BUFF1] + .LEN;          ! Next free byte
3            RETURN .RUN[RUN_BUFF1] - .LEN;
3            END
2        ELSE
2            RUN[RUN_BUFF0] = .RUN[RUN_BUFF0] + .LEN;          ! Reset
2
2
2        ! Not all of this record is in the buffer.
2        !
2        ! We move the first part of the record backwards in the buffer, so that
2        ! the first part ends at a page boundary.  Then we request that the rest
2        ! of the buffer be filled.
2        !
3        BEGIN
3        LOCAL
3            TMP,
3            P:      VECTOR[2];
3
3        ! Compute the address of the next free byte following the copied string.
3        ! Then actually copy the first part of the string.
3        !
3        P[1] = .RUN[RUN_BUFFER] + ROUND_(.RUN[RUN_BUFF0], COM_K_BPERPAGE);
3        TMP = .P[1] - .RUN[RUN_BUFF0];
3        CH$MOVE(.RUN[RUN_BUFF0], .RUN[RUN_BUFF1], .TMP);
3
3        ! Set BUFF0/1 to the length/address of the start of the (moved) record.
3        !
3        RUN[RUN_BUFF0] = .RUN[RUN_BUFF0] + .RUN[RUN_BUFF1] - .TMP;
3        RUN[RUN_BUFF1] = .TMP;
3
3        ! Set up for the read
3        !
3        P[0] = .RUN[RUN_BUFF1] + .RUN[RUN_BUFF0] - .P[1];
3
3        ! Fill the buffer
3        !
3        IF NOT FILL(RUN[BASE_], P[0])
3        THEN
3            RETURN DELRUN(RUN[BASE_]);        ! Return 0 to indicate end of file
3
3        RUN[RUN_BUFF0] = .RUN[RUN_BUFF0] - .LEN;
3        RUN[RUN_BUFF1] = .RUN[RUN_BUFF1] + .LEN;
3        RETURN .RUN[RUN_BUFF1] - .LEN;
2        END;
2
1        END;
```

```
                                  5A DD 00000 SOR$$WORK_READ::
                                                    PUSHL   R10                           ; 1912
                  5E              1C C2 00002       SUBL2   #28, SP                       ;
                                  59 DD 00005       PUSHL   RUNBLOCK                      ; 1952
                            5C    AB 95 00007       TSTB    92(CTX)                       ; 1957
                                  08 18 0000A       BGEQ    1$                            ;
                  59              6E D0 0000C       MOVL    RUN, R9                       ; 1959
                                FDA5 30 0000F       BSBW    MRG_WORK_READ                 ;
                                  3A 11 00012       BRB     3$                            ;
      50          6E              20 C1 00014 1$:   ADDL3   #32, RUN, R0                  ; 1962
                                  60 D7 00018       DECL    (R0)                          ;
      50          6E              20 C1 0001A       ADDL3   #32, RUN, R0                  ; 1963
                                  60 D5 0001E       TSTL    (R0)                          ;
                                  03 18 00020       BGEQ    2$                            ;
                                0086 31 00022       BRW     5$                            ;
              0C  AE      0088    CB 3C 00025 2$:   MOVZWL  136(CTX), LEN                 ; 1970
      50          6E              18 C1 0002B       ADDL3   #24, RUN, R0                  ; 1975
              04  AE              60 9E 0002F       MOVAB   (R0), 4(SP)                   ;
              04  BE        0C    AE C2 00033       SUBL2   LEN, @4(SP)                   ;
                                  16 19 00038       BLSS    4$                            ;
      50          6E              1C C1 0003A       ADDL3   #28, RUN, R0                  ; 1978
                  60        0C    AE C0 0003E       ADDL2   LEN, (R0)                     ;
      50          6E              1C C1 00042       ADDL3   #28, RUN, R0                  ; 1979
      59          60        0C    AE C3 00046       SUBL3   LEN, (R0), R9                 ;
                  50              59 D0 0004B       MOVL    R9, R0                        ;
                                  74 11 0004E 3$:   BRB     7$                            ;
              04  BE        0C    AE C0 00050 4$:   ADDL2   LEN, @4(SP)                   ; 1982
      50      04  BE  000001FF    8F C1 00055       ADDL3   #511, @4(SP), R0              ; 1999
                  50      01FF    8F AA 0005E       BICW2   #511, R0                      ;
      51          6E              14 C1 00063       ADDL3   #20, RUN, R1                  ;
  14  AE          50              61 C1 00067       ADDL3   (R1), R0, P+4                 ;
      56      14  AE        04    BE C3 0006C       SUBL3   @4(SP), P+4, TMP              ; 2000
      50          6E              1C C1 00072       ADDL3   #28, RUN, R0                  ; 2001
              08  AE              60 9E 00076       MOVAB   (R0), 8(SP)                   ;
                  59        08    BE D0 0007A       MOVL    @8(SP), R9                    ;
      66          69        04    BE 28 0007E       MOVC3   @4(SP), (R9), (TMP)           ;
      50      04  BE        08    BE C1 00083       ADDL3   @8(SP), @4(SP), R0            ; 2005
  04  BE          50              56 C3 00089       SUBL3   TMP, R0, @4(SP)               ;
              08  BE              56 D0 0008E       MOVL    TMP, @8(SP)                   ; 2006
      50      08  BE        04    BE C1 00092       ADDL3   @4(SP), @8(SP), R0            ; 2010
  10  AE          50        14    AE C3 00098       SUBL3   P+4, R0, P                    ;
                  5A        10    AE 9E 0009E       MOVAB   P, R10                        ; 2014
                  59              6E D0 000A2       MOVL    RUN, R9                       ;
                                FEA0 30 000A5       BSBW    FILL                          ;
                  09              50 E8 000A8       BLBS    R0, 6$                        ;
                                  6E DD 000AB 5$:   PUSHL   RUN                           ; 2016
           0000V  CF              01 FB 000AD       CALLS   #1, DELRUN                    ;
                                  10 11 000B2       BRB     7$                            ;
              04  BE        0C    AE C2 000B4 6$:   SUBL2   LEN, @4(SP)                   ; 2018
              08  BE        0C    AE C0 000B9       ADDL2   LEN, @8(SP)                   ; 2019
      50      08  BE        0C    AE C3 000BE       SUBL3   LEN, @8(SP), R0               ; 2020
                  5E              20 C0 000C4 7$:   ADDL2   #32, SP                       ; 2023
                  5A              8E D0 000C7       MOVL    (SP)+, R10                    ;
                                     05 000CA       RSB                                   ;
```

```
; Routine Size:  203 bytes,    Routine Base:  SOR$RO_CODE + 082D
```

```
1 GLOBAL ROUTINE POSITION                              ! Position to start of run
1         (
1         RUNBLOCK:       REF RUN_BLOCK                ! Run to be positioned to
1         ):      CAL_CTXREG NOVALUE =
1 !++
1 !
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       This routine positions to a run in a work file.
1 !       It also starts reading that run.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       RUNBLOCK        Address of run description block to be positioned to
1 !       CTX             Longword pointing to work area (passed in COM_REG_CTX)
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       NONE
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !--
2     BEGIN
2     EXTERNAL REGISTER
2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
2     LOCAL
2         RUN:    REF RUN_BLOCK,                       ! Pointer to run block
2         STATUS;
2     LOCAL
2         P:      VECTOR[2],
2         IOSB:   VECTOR[4,WORD];
2
2
2     ! Get a pointer to the run description block, and a buffer for the run
2     !
2     RUN = RUNBLOCK[BASE_];
2     GET_BUFFER(RUN[BASE_]);
2
2
2     ! Set up for the read.
2     ! Set the starting virtual block address of this run.
2     ! Set the length and address of the buffer.
2     !
2     RUN[RUN_RDB_CURR] = .RUN[RUN_RDB];
2     RUN[RUN_VBN] = .BBLOCK[.RUN[RUN_RDB_CURR],RDB_VBN];
2
2     P[0] = MINU(.RUN[RUN_BUFF0], .RUN[RUN_SIZE]^LN2_(COM_K_BPERPAGE));
```

```
; 2036        2081  2      P[1] = .RUN[RUN_BUFFER];
; 2037        2082  2
; 2038        2083  2      ! Fill the buffer
; 2039        2084  2      !
; 2040        2085  2      IF NOT FILL(RUN[BASE_], P[0])
; 2041        2086  2      THEN
; 2042        2087  3          BEGIN
; 2043        2088  3          RUN[RUN_COUNT] = 0;               ! Indicate end of file
; 2044        2089  3          RETURN;
; 2045        2090  2          END;
; 2046        2091  2
; 2047        2092  1      END;




                                    06FC 00000          .ENTRY  POSITION, Save R2,R3,R4,R5,R6,R7,R9,R10          ; 2024
              5E                 10   C2 00002          SUBL2   #16, SP                                          ;
              57        04       AC   D0 00005          MOVL    RUNBLOCK, RUN                                    ; 2069
                                 57   DD 00009          PUSHL   RUN                                              ; 2070
         F6F8 CF                 01   FB 0000B          CALLS   #1, GET_BUFFER                                   ;
           10 A7        24       A7   D0 00010          MOVL    36(RUN), 16(RUN)                                 ; 2077
              50        10       A7   D0 00015          MOVL    16(RUN), R0                                      ; 2078
           08 A7        08       A0   D0 00019          MOVL    8(R0), 8(RUN)                                    ;
     50    0C A7                 09   78 0001E          ASHL    #9, 12(RUN), R0                                  ; 2080
              59        18       A7   D0 00023          MOVL    24(RUN), R9                                      ;
              50                 59   D1 00027          CMPL    R9, R0                                           ;
                                 03   1B 0002A          BLEQU   1$                                               ;
              59                 50   D0 0002C          MOVL    R0, R9                                           ;
           08 AE                 59   D0 0002F  1$:     MOVL    R9, P                                            ;
           0C AE        14       A7   D0 00033          MOVL    20(RUN), P+4                                     ; 2081
              5A        08       AE   9E 00038          MOVAB   P, R10                                           ; 2085
              59                 57   D0 0003C          MOVL    RUN, R9                                          ;
                               FE3B   30 0003F          BSBW    FILL                                             ;
              03                 50   E8 00042          BLBS    R0, 2$                                           ;
                        20       A7   D4 00045          CLRL    32(RUN)                                          ; 2088
                                      04 00048  2$:     RET                                                      ; 2092

; Routine Size:  73 bytes,    Routine Base:  SOR$RO_CODE + 08F8
```

```
1 ROUTINE DELRUN                                  ! Indicate this run is through
1       (
1       RUNBLOCK:       REF RUN_BLOCK           ! Run description block
1       ):      CAL_CTXREG =
1 !++
1 !
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !     This routine indicates that processing for a run is complete.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !     RUNBLOCK        Address of run description block of run to delete
1 !     CTX             Longword pointing to work area (passed in COM_REG_CTX)
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !     NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !     NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !     Zero.
1 !
1 ! SIDE EFFECTS:
1 !
1 !     NONE
1 !--
2     BEGIN
2     EXTERNAL REGISTER
2       CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
2     LOCAL
2       P:      REF RUN_BLOCK,
2       Q:      REF VECTOR[1],
2       R:      REF RDB_BLOCK,
2       STATUS;
2
2
2     ! One less outstanding run
2     !
2     CTX[COM_RUNS] = .CTX[COM_RUNS] - 1;         ! One less run
2
2     ! Free all RDBs connected to this RUN block
2     !
2     Q = RUNBLOCK[RUN_RDB];
2     RUNBLOCK[RUN_RDB_CURR] = 0;
2     MOVE_ALL_RDBS_( Q[0], WFB_FREE );
2
2     ! Find the run description block in the list of active runs,
2     ! and remove it from this list.
2     !
2     Q = CTX[S_RUN_INFO];
2     WHILE (P = .Q[0]) NEQ 0 DO
3       BEGIN
```

```
; 2106          2150  3          IF P[BASE_] EQL RUNBLOCK[BASE_] THEN EXITLOOP;
; 2107          2151  3          Q = P[RUN_NEXT];
; 2108          2152  2          END;
; 2109          2153  2      IF P[BASE_] EQL 0
; 2110          2154  2      THEN
; 2111          2155  2          RETURN SOR$$FATAL(SOR$_SHR_BADLOGIC);   ! We couldn't find it
; 2112          2156  2
; 2113          2157  2      ! Free the buffer associated with this run.
; 2114          2158  2      ! Unlink and deallocate the run block.
; 2115          2159  2      !
; 2116          2160  2      FREE_BUFFER(P[BASE_]);                      ! Free this run's buffer
; 2117          2161  2      REMLA_(Q[0], P, RUN_NEXT, RUN_K_SIZE);      ! Unlink this RUN block
; 2118          2162  2
; 2119          2163  2      ! Return zero, since most of our callers want to immediately return 0
; 2120          2164  2      ! after calling us.
; 2121          2165  2      !
; 2122          2166  2      RETURN 0;
; 2123          2167  1      END;



                              001C 00000 DELRUN: .WORD   Save R2,R3,R4                                 ; 2093
                          7A   AB  B7 00002          DECW    122(CTX)                                      ; 2136
              53          04   AC  D0 00005          MOVL    RUNBLOCK, R3                                  ; 2140
              52          24   A3  9E 00009          MOVAB   36(R3), Q                                     ;
                          10   A3  D4 0000D          CLRL    16(R3)                                        ; 2141
                               62  D5 00010 1$:      TSTL    (Q)                                           ; 2142
                               0B  13 00012          BEQL    2$                                            ;
                               10  DD 00014          PUSHL   #16                                           ;
                               52  DD 00016          PUSHL   Q                                             ;
       FB49   CF               02  FB 00018          CALLS   #2, FREE_RDB                                  ;
                               F1  11 0001D          BRB     1$                                            ;
              52        00D8   CB  9E 0001F 2$:      MOVAB   216(R11), Q                                   ; 2147
              54               62  D0 00024 3$:      MOVL    (Q), P                                        ; 2148
                               0A  13 00027          BEQL    4$                                            ;
              53               54  D1 00029          CMPL    P, R3                                         ; 2150
                               05  13 0002C          BEQL    4$                                            ;
              52               54  D0 0002E          MOVL    P, Q                                          ; 2151
                               F1  11 00031          BRB     3$                                            ; 2148
                               54  D5 00033 4$:      TSTL    P                                             ; 2153
                               0E  12 00035          BNEQ    5$                                            ;
                    001C1124   8F  DD 00037          PUSHL   #1839396                                      ; 2155
  00000000G   00               01  FB 0003D          CALLS   #1, SOR$$ERROR                                ;
                               04 00044              RET                                                   ;
                               54  DD 00045 5$:      PUSHL   P                                             ; 2160
       F701   CF               01  FB 00047          CALLS   #1, FREE_BUFFER                               ;
                               64  DD 0004C          PUSHL   (P)                                           ; 2161
                               52  DD 0004E          PUSHL   Q                                             ;
                               28  DD 00050          PUSHL   #40                                           ;
  00000000G   00               03  FB 00052          CALLS   #3, SOR$$DEALLOCATE                           ;
                               50  D4 00059          CLRL    R0                                            ; 2166
                               04 0005B              RET                                                   ; 2167

; Routine Size:  92 bytes,    Routine Base:  SOR$RO_CODE + 0941
```

```
1 ROUTINE WORK_OPEN
1       (
1       FNS:    REF VECTOR[2]               ! Work file name string
1       ) : CAL_CTXREG NOVALUE =
1
1 !++
1 !
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       This routine creates/opens the work files.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       FNS     File name string of work file to be opened (optional)
1 !               If not present, all COM_WORK_FILES work files are opened.
1 !               If present, only one work file is opened.
1 !       CTX     Longword pointing to work area (passed in COM_REG_CTX)
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       NONE
1 !
1 ! SIDE EFFECTS:
1 !
1 !       CTX[S_BUF_SIZE] is calculated.
1 !--
2     BEGIN
2     EXTERNAL REGISTER
2       CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
2     BUILTIN
2       NULLPARAMETER;
2     LOCAL
2       FAB:    $FAB_DECL,                  ! FAB for the work file
2       NAM:    $NAM_DECL VOLATILE,         ! NAM for the work file
2       FNA:    VECTOR[NAM$C_MAXRSSLCL,BYTE],   ! File name string
2       WFB:    REF WFB_BLOCK,              ! Pointer to WFB for work files
2       WFB_PTR:        REF VECTOR[1,LONG], ! Addr of pointer to WFB
2       XABPRO: $XABPRO_DECL,               ! XAB for file protection
2       STATUS;                             ! Status
2
2
2     ! Set the default extend amount to half the tree size
2     !
2     CTX[S_WRK_DEQ] = MAXU(
2       .CTX[COM_TREE_LEN] ^ -LN2 (COM_K_BPERBLOCK*2),
2       TUN_K_BUFSIZE / COM_K_BPERBLOCK);
2
2     ! Get an event flag to use for work file I/O
2     !
```

```
; 2182          2225  2         %IF NOT HOSTILE %THEN
; 2183          2226  2         STATUS = LIB$GET_EF(CTX[S_WRK_EFN]);
; 2184          2227  2         IF NOT .STATUS
; 2185          2228  2         THEN
; 2186          2229  2             RETURN SOR$$ERROR(SOR$_SHR_SYSERROR, 0, .STATUS);
; 2187          2230  2         %FI
; 2188          2231  2
; 2189        P 2232  2         $FAB_INIT(
; 2190        P 2233  2             FAB = FAB[BASE_],
; 2191        P 2234  2             NAM = NAM[BASE_],
; 2192        P 2235  2             FNA = FNA[0],
; 2193        P 2236  2 !           FNS = 0,                ! Set below
; 2194        P 2237  2             DNA = UPLIT BYTE(STR_DEF_WORKFILE),
; 2195        P 2238  2             DNS = %CHARCOUNT(STR_DEF_WORKFILE),
; 2196        L 2239  2 %IF TUN_K_WRK_PREALL
; 2197        U 2240  2 %THEN
; 2198        U 2241  2             ALQ = 2 * .CTX[S_WRK_DEQ]                    ! Tree size
; 2199        U 2242  2                     / .CTX[COM_WRK_FILES],               ! Divided by number of files
; 2200        P 2243  2 %FI
; 2201        P 2244  2             DEQ = .CTX[S_WRK_DEQ],                       ! Default extension quantity
; 2202        P 2245  2 !           BKS = 0,                ! Only for relative or indexed files
; 2203        P 2246  2 !           BLS = 0,                ! Only for magnetic tape files
; 2204        P 2247  2             FAC = <BIO,DEL,GET,PUT,UPD>,
; 2205        P 2248  2             FOP = <CBT,DFW,DLT,SUP,TMD,TMP,SQO,UFO>,         ! TMD,TMP???
; 2206        P 2249  2             FSZ = 0,
; 2207        P 2250  2             MRN = 0,
; 2208        P 2251  2             MRS = COM_K_BPERBLOCK,
; 2209        P 2252  2             ORG = SEQ,
; 2210        P 2253  2 !           RAT = 0,                ! No special record attributes
; 2211        P 2254  2             RFM = FIX,              ! Fixed format records
; 2212        P 2255  2             RTV = 10,               ! 10 retrieval pointers
; 2213        P 2256  2 !           SHR = GET,              ! Allow others to read this file
; 2214          2257  2             XAB = XABPRO[BASE_]);   ! File protection XAB
; 2215        P 2258  2         $NAM_INIT(
; 2216        P 2259  2             NAM = NAM[BASE_],
; 2217        P 2260  2             ESS = NAM$C_MAXRSSLCL,
; 2218        P 2261  2             ESA = FNA[0],
; 2219        P 2262  2             RSS = NAM$C_MAXRSSLCL,
; 2220          2263  2             RSA = FNA[0]);
; 2221          2264  2
; 2222          2265  2
; 2223          2266  2         WFB_PTR = CTX[S_WRK_WFB];
; 2224          2267  2         WHILE .WFB_PTR[0] NEQ 0 DO WFB_PTR = BBLOCK[.WFB_PTR[0],WFB_NEXT];
; 2225          2268  2         DECR I FROM .CTX[COM_WRK_FILES]-1 TO 0 DO
; 2226          2269  3             BEGIN
; 2227          2270  3             STRUCTURE
; 2228          2271  3                 BVECTOR[I;N,EXT=0] = [N](BVECTOR+I)<0,8,EXT>;
; 2229          2272  3             !
; 2230          2273  3             ! Allocate WFB and link into list (advance to next file at end of loop)
; 2231          2274  3             ! These are put at the end of the list so that SORTWORK0 is used first,
; 2232          2275  3             ! followed by SORTWORK1, et cetera.
; 2233          2276  3             !
; 2234          2277  3             WFB = SOR$$ALLOCATE(WFB_K_SIZE);
; 2235          2278  3             WFB_PTR[0] = WFB[WFB_NEXT];     ! Store address of the next pointer
; 2236          2279  3
; 2237          2280  3             ! Get the name of this file
; 2238          2281  3             !
; 2239           2282   3           IF NOT NULLPARAMETER(1)
; 2240           2283   3           THEN
; 2241           2284   4               BEGIN
; 2242           2285   4               CH$MOVE(
; 2243           2286   4                   (FAB[FAB$B_FNS] = MINU(.FNS[0], %ALLOCATION(FNA))),
; 2244           2287   4                   .FNS[1], FNA[0]);
; 2245           2288   4               END
; 2246           2289   3           ELIF .I GEQU .BVECTOR[CTX[COM_WF_NAMES], 0]
; 2247           2290   3           THEN
; 2248           2291   4               BEGIN
; 2249           2292   4               FAB[FAB$B_FNS] = %CHARCOUNT(STR_LOG_WORKFILE)+1;
; 2250           2293   4               CH$MOVE(
; 2251           2294   4                   %CHARCOUNT(STR_LOG_WORKFILE),
; 2252           2295   4                   UPLIT BYTE(STR_LOG_WORKFILE),
; 2253           2296   4                   FNA[0]);
; 2254           2297   4               ASSERT_(%CHARCOUNT(STR_LOG_WORKNUM) GEQ MAX_WORK_FILES)
; 2255           2298   4               FNA[%CHARCOUNT(STR_LOG_WORKFILE)] = .BVECTOR[UPLIT BYTE(
; 2256           2299   4                   %EXACTSTRING(MAX_WORK_FILES,0,STR_LOG_WORKNUM)), .I];
; 2257           2300   4               END
; 2258           2301   3           ELSE
; 2259           2302   3               %IF NOT HOSTILE %THEN
; 2260           2303   4               BEGIN
; 2261           2304   4               LIBRARY 'SRC$:SRTSPC';
; 2262           2305   4               LOCAL
; 2263           2306   4                   CFT: REF CFT_TAB[1];
; 2264           2307   4               CFT = CFT_TAB[.CTX[COM_CFT_ADR],
; 2265           2308   4                   .BVECTOR[CTX[COM_WF_NAMES], .I+1], BASE_];
; 2266           2309   4               CH$MOVE(
; 2267           2310   4                   (FAB[FAB$B_FNS] = MINU(.CFT[0,CFT_CON_LEN], %ALLOCATION(FNA))),
; 2268           2311   4                   .CFT[0,CFT_CON_ADR]+.CTX[COM_CFT_ADR], FNA[0]);
; 2269           2312   3               END;
; 2270         U 2313   3               %ELSE
; 2271         U 2314   3               RETURN SOR$$FATAL(SOR$_SHR_BADLOGIC);
; 2272           2315   3               %FI
; 2273           2316   3
; 2274           2317   3           ! Clear these fields, since we are reusing the NAM, FAB and XAB blocks
; 2275           2318   3           !
; 2276           2319   3           NAM[NAM$B_RSL] = 0;
; 2277           2320   3           NAM[NAM$B_ESL] = 0;
; 2278           2321   3           FAB[FAB$W_IFI] = 0;
; 2279         P 2322   3           $XABPRO_INIT(
; 2280         P 2323   3               XAB = XABPRO[BASE_],
; 2281           2324   3               PRO = <D,RWED>);
; 2282           2325   3
; 2283           2326   3           ! Actually create the work file
; 2284           2327   3           !
; 2285         P 2328   3           STATUS = $CREATE(FAB = FAB[BASE_]
; 2286           2329   3               %IF HOSTILE_ELAN %THEN , ELAN = .CTX[COM_CTXADR] %FI );
; 2287           2330   3
; 2288           2331   3           ! Get the best file name string available into NAM$B_RSL/NAM$L_RSA
; 2289           2332   3           !
; 2290           2333   3           SOR$$BEST_FILE_NAME(FAB[BASE_], WFB[WFB_NAME]);
; 2291           2334   3
; 2292           2335   3           ! Check status
; 2293           2336   3           !
; 2294           2337   3           IF NOT .FAB[FAB$L_STS]
; 2295           2338   3           THEN
; 2296          2339  4                 BEGIN
; 2297          2340  4                 SOR$$ERROR(SOR$_SHR_OPENOUT AND NOT STS$M_SEVERITY OR STS$K_ERROR,
; 2298          2341  4                     1, WFB[WFB_NAME], .FAB[FAB$L_STS], .FAB[FAB$L_STV]);
; 2299          2342  4                 END
; 2300          2343  3             ELIF NOT .BBLOCK[FAB[FAB$L_DEV], DEV$V_RND] OR .NAM[NAM$V_NODE]
; 2301          2344  3             THEN
; 2302          2345  4                 BEGIN
; 2303          2346  4                 !
; 2304          2347  4                 ! Device must be local and random access.
; 2305          2348  4                 !
; 2306        P 2349  4                 $DASSGN(CHAN=.FAB[FAB$L_STV]
; 2307          2350  4                     %IF HOSTILE_ELAN %THEN , ELAN = .CTX[COM_CTXADR] %FI );
; 2308          2351  4                 SOR$$ERROR(SOR$_WORK_DEV, 1, WFB[WFB_NAME]);
; 2309          2352  4                 END
; 2310          2353  3             ELSE
; 2311          2354  4                 BEGIN
; 2312          2355  4                 !
; 2313          2356  4                 ! Save the channel number (returned in STV)
; 2314          2357  4                 ! Create a large hole describing available space.
; 2315          2358  4                 !
; 2316          2359  4                 LOCAL
; 2317          2360  4                     RDB:    REF RDB_BLOCK;
; 2318          2361  4                 WFB[WFB_CHAN] = .FAB[FAB$L_STV];
; 2319          2362  4                 RDB = SOR$$ALLOCATE(RDB_K_SIZE);
; 2320          2363  4                 INSLH (WFB[WFB_NOUSE], RDB, RDB_NEXT);
; 2321          2364  4                 RDB[RDB_WFB] = WFB[BASE_];              ! Reference the WFB
; 2322          2365  4                 RDB[RDB_VBN] = 1;                       ! First virtual block number
; 2323          2366  4                 RDB[RDB_SIZE] = -1;                     ! A very large hole
; 2324          2367  3                 END;
; 2325          2368  3
; 2326          2369  3             !
; 2327          2370  3             ! Check for an error
; 2328          2371  3             !
; 2329          2372  3             IF .WFB[WFB_CHAN] EQL 0
; 2330          2373  3             THEN
; 2331          2374  4                 BEGIN
; 2332          2375  4                 !
; 2333          2376  4                 ! Deallocate and unlink
; 2334          2377  4                 !
; 2335          2378  4                 SOR$$FREE_FILE_NAME(WFB[WFB_NAME]); ! Free name string
; 2336          2379  4                 REMLH (WFB_PTR[0], WFB, WFB_NEXT, WFB_K_SIZE);
; 2337          2380  4                 CTX[COM_WRK_FILES] = .CTX[COM_WRK_FILES] - 1;
; 2338          2381  4                 END
; 2339          2382  3             ELSE
; 2340          2383  4                 BEGIN
; 2341          2384  4                 IF NOT NULLPARAMETER(1)
; 2342          2385  4                 THEN
; 2343          2386  4                     SOR$$ERROR(SOR$_USE_ALT,
; 2344          2387  4                         2, UPLIT(%ASCIC 'work'), WFB[WFB_NAME]);
; 2345          2388  4                 WFB_PTR = WFB[WFB_NEXT];                ! Advance to next WFB
; 2346          2389  3                 END;
; 2347          2390  2             END;
; 2348          2391  2
; 2349          2392  2         ! If we didn't get enough work files, abort.
; 2350          2393  2         !
; 2351          2394  2         IF NOT NULLPARAMETER(1) THEN RETURN;
; 2352          2395  2         IF .CTX[COM_WRK_FILES] LSS MIN_WORK_FILES
; 2353          2396  2      THEN
; 2354          2397  3          BEGIN
; 2355          2398  3          LOCAL
; 2356          2399  3              SYS_DISK: VECTOR[2] INITIAL(
; 2357          2400  3                  %CHARCOUNT('SYS$DISK:'),
; 2358          2401  3                  UPLIT BYTE('SYS$DISK:'));
; 2359          2402  3
; 2360          2403  3          ! Try using SYS$DISK for the work files
; 2361          2404  3          !
; 2362          2405  3          CTX[COM_WRK_FILES] = MIN_WORK_FILES;
; 2363          2406  3          ASSERT_(MIN_WORK_FILES EQL 1)
; 2364          2407  3          WORK_OPEN(SYS_DISK);
; 2365          2408  3          IF .CTX[COM_WRK_FILES] LSS MIN_WORK_FILES
; 2366          2409  3          THEN
; 2367          2410  3              RETURN SOR$$FATAL(SOR$_NO_WRK);
; 2368          2411  2          END;
; 2369          2412  2
; 2370          2413  2
; 2371          2414  2      ! CTX[S_BUF_SIZE] is the number of bytes to use for each buffer.
; 2372          2415  2      ! It may have been calculated earlier, but that calculation may have been
; 2373          2416  2      ! too small.  We need at least enough room for a record (rounded up to a
; 2374          2417  2      ! full number of pages) plus an extra page.
; 2375          2418  2      !
; 2376          2419  2      ASSERT_(COM_K_BPERPAGE EQL COM_K_BPERBLOCK)
; 2377          2420  2      ASSERT_(TUN_K_BUFSIZE GEQ 2*COM_K_BPERPAGE)
; 2378          2421  2      CTX[S_BUF_SIZE] = MAX(
; 2379          2422  2          TUN_K_BUFSIZE,
; 2380          2423  2          .CTX[COM_LRL_INT] + COM_K_BPERPAGE,
; 2381          2424  2          .CTX[S_BUF_SIZE]);
; 2382          2425  2      CTX[S_BUF_SIZE] = ROUND_(.CTX[S_BUF_SIZE], COM_K_BPERPAGE);
; 2383          2426  2
; 2384          2427  1      END;


52  4F  53  3A  48  43  54  41  52  43  53  24  53  59  53  0099D P.AAA:  .ASCII  \SYS$SCRATCH:SORTWORK.TMP\               ;
                        50  4D  54  2E  4B  52  4F  57  54  009AC
                            4B  52  4F  57  54  52  4F  53  009B5 P.AAB:  .ASCII  \SORTWORK\                               ;
                    39  38  37  36  35  34  33  32  31  30  009BD P.AAC:  .ASCII  \0123456789\                             ;
                                                            009C7         .BLKB   1
                            00  00  00  6B  72  6F  77  04  009C8 P.AAD:  .ASCII  <4>\work\<0><0><0>                       ;
                        3A  4B  53  49  44  24  53  59  53  009D0 P.AAE:  .ASCII  \SYS$DISK:\                              ;

                                                                          .EXTRN  SYS$CREATE, SYS$DASSGN

                                                  07FC 00000 WORK_OPEN:
                                                                          .WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10         ; 2168
                           5A 00000000G   00   9E 00002                   MOVAB   SOR$$ERROR, R10                          ;
                           5E       FDF0  CE   9E 00009                   MOVAB   -528(SP), SP                             ;
                  50     00C4  CB       F6    8F   78 0000E                   ASHL    #-10, 196(CTX), R0                       ; 2220
                           32                 50   D1 00015                   CMPL    R0, #50                                  ; 2221
                                              03   1E 00018                   BGEQU   1$                                       ;
                           50                 32   D0 0001A                   MOVL    #50, R0                                  ;
                    00DC   CB                 50   D0 0001D 1$:               MOVL    R0, 220(CTX)                             ; 2219
                                    00E0      CB   9F 00022                   PUSHAB  224(CTX)                                 ; 2226
               00000000G   00                 01   FB 00026                   CALLS   #1, LIB$GET_EF                           ;
                           59                 50   D0 0002D                   MOVL    R0, STATUS                               ;
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                                             0E                59 E8 00030       BLBS    STATUS, 2$                          ; 2227
                                                               59 DD 00033       PUSHL   STATUS                              ; 2229
                                                               7E D4 00035       CLRL    -(SP)                               ;
                                                   001C11B4    8F DD 00037       PUSHL   #1839540                            ;
                                             6A                03 FB 0003D       CALLS   #3, SOR$$ERROR                      ;
                                                                  04 00040       RET                                         ;
         0050    8F              00          6E                00 2C 00041 2$:   MOVC5   #0, (SP), #0, #80, $RMS_PTR         ; 2257
                                                         B0    AD    00048                                               ;
                                          B0 AD        5003    8F B0 0004A       MOVW    #20483, $RMS_PTR                    ;
                                          B4 AD    0022807C    8F D0 00050       MOVL    #2261116, $RMS_PTR+4                ;
                                          C4 AD        00DC    CB B0 00058       MOVW    220(CTX), $RMS_PTR+20               ;
                                          C6 AD                2F 90 0005E       MOVB    #47, $RMS_PTR+22                    ;
                                          CC AD                0A B0 00062       MOVW    #10, $RMS_PTR+28                    ;
                                          CF AD                01 90 00066       MOVB    #1, $RMS_PTR+31                     ;
                                          D4 AD          08    AE 9E 0006A       MOVAB   XABPRO, $RMS_PTR+36                 ;
                                          D8 AD        FF50    CD 9E 0006F       MOVAB   NAM, $RMS_PTR+40                    ;
                                          DC AD          60    AE 9E 00075       MOVAB   FNA, $RMS_PTR+44                    ;
                                          E0 AD        FF46    CF 9E 0007A       MOVAB   P.AAA, $RMS_PTR+48                  ;
                                          E5 AD                18 90 00080       MOVB    #24, $RMS_PTR+53                    ;
                                          E6 AD        0200    8F B0 00084       MOVW    #512, $RMS_PTR+54                   ;
         0060    8F              00          6E                00 2C 0008A       MOVC5   #0, (SP), #0, #96, $RMS_PTR         ; 2263
                                                       FF50    CD    00091                                               ;
                                        FF50 CD        6002    8F B0 00094       MOVW    #24578, $RMS_PTR                    ;
                                        FF52 CD                01 8E 0009B       MNEGB   #1, $RMS_PTR+2                      ;
                                        FF54 CD          60    AE 9E 000A0       MOVAB   FNA, $RMS_PTR+4                     ;
                                        FF5A CD                01 8E 000A6       MNEGB   #1, $RMS_PTR+10                     ;
                                        FF5C CD          60    AE 9E 000AB       MOVAB   FNA, $RMS_PTR+12                    ;
                                             58        00E4    CB 9E 000B1       MOVAB   228(R11), WFB_PTR                   ; 2266
                                                               68 D5 000B6 3$:   TSTL    (WFB_PTR)                           ; 2267
                                                               05 13 000B8       BEQL    4$                                  ;
                                             58                68 D0 000BA       MOVL    (WFB_PTR), WFB_PTR                  ;
                                                               F7 11 000BD       BRB     3$                                  ;
                                             57          5A    AB 9A 000BF 4$:   MOVZBL  90(CTX), I                          ; 2268
                                                             014C 31 000C3       BRW     16$                                 ;
                                                               20 DD 000C6 5$:   PUSHL   #32                                 ; 2277
                                   00000000G 00                01 FB 000C8       CALLS   #1, SOR$$ALLOCATE                   ;
                                             56                50 D0 000CF       MOVL    R0, WFB                             ;
                                             68                56 D0 000D2       MOVL    WFB, (WFB_PTR)                      ; 2278
                                                               6C 95 000D5       TSTB    (AP)                                ; 2282
                                                               25 13 000D7       BEQL    7$                                  ;
                                                         04    AC D5 000D9       TSTL    4(AP)                               ;
                                                               20 13 000DC       BEQL    7$                                  ;
                                             50          04    AC D0 000DE       MOVL    FNS, R0                             ; 2286
                                             51                60 D0 000E2       MOVL    (R0), R1                            ;
                                    000000FF 8F                51 D1 000E5       CMPL    R1, #255                            ;
                                                               04 1B 000EC       BLEQU   6$                                  ;
                                             51          FF    8F 9A 000EE       MOVZBL  #255, R1                            ;
                                          E4 AD                51 90 000F2 6$:   MOVB    R1, FAB+52                          ;
                          60   AE         04 B0                51 28 000F6       MOVC3   R1, @4(R0), FNA                     ; 2287
                                                               3E 11 000FC       BRB     9$                                  ; 2282
                 57     0134   CB            08                00 ED 000FE 7$:   CMPZV   #0, #8, 308(CTX), I                 ; 2289
                                                               14 1A 00105       BGTRU   8$                                  ;
                                          E4 AD                09 90 00107       MOVB    #9, FAB+52                          ; 2292
                          60   AE       FECC CF                08 28 0010B       MOVC3   #8, P.AAB, FNA                      ; 2296
                                          68 AE        FECD  CF47 90 00112       MOVB    P.AAC[I], FNA+8                     ; 2298
                                                               21 11 00119       BRB     9$                                  ; 2288
                                             50        0135  CB47 9A 0011B 8$:   MOVZBL  309(CTX)[I], R0                     ; 2308
                                        50              06 C4 00121         MULL2   #6, R0                            ;
                                        50        010C  CB C0 00124         ADDL2   268(CTX), CFT                     ;
                                        51              60 9A 00129         MOVZBL  (CFT), R1                         ; 2310
                                   E4   AD              51 90 0012C         MOVB    R1, FAB+52                        ;
                            50     02   A0        010C  CB C1 00130         ADDL3   268(CTX), 2(CFT), R0              ; 2311
                      60    AE          60              51 28 00137         MOVC3   R1, (R0), FNA                     ;
                                                  FF53  CD 94 0013C  9$:    CLRB    NAM+3                             ; 2319
                                                  FF5B  CD 94 00140         CLRB    NAM+11                            ; 2320
                                                    B2  AD B4 00144         CLRW    FAB+2                             ; 2321
    0058    8F              00          6E              00 2C 00147         MOVC5   #0, (SP), #0, #88, $RMS_PTR       ; 2324
                                                    08  AE    0014E                                                   ;
                                   08   AE        5813  8F B0 00150         MOVW    #22547, $RMS_PTR                  ;
                                   10   AE        FF07  8F B0 00156         MOVW    #-249, $RMS_PTR+8                 ;
                                                    B0  AD 9F 0015C         PUSHAB  FAB                               ; 2329
                            00000000G   00              01 FB 0015F         CALLS   #1, SYS$CREATE                    ;
                                        59              50 D0 00166         MOVL    R0, STATUS                        ;
                                        52          04  A6 9E 00169         MOVAB   4(WFB), R2                        ; 2333
                                                        52 DD 0016D         PUSHL   R2                                ;
                                                    B0  AD 9F 0016F         PUSHAB  FAB                               ;
                            00000000G   00              02 FB 00172         CALLS   #2, SOR$$BEST_FILE_NAME           ;
                                        13          B8  AD E8 00179         BLBS    FAB+8, 10$                        ; 2337
                                        7E          B8  AD 7D 0017D         MOVQ    FAB+8, -(SP)                      ; 2341
                                                        52 DD 00181         PUSHL   R2                                ;
                                                        01 DD 00183         PUSHL   #1                                ;
                                              001C10A2  8F DD 00185         PUSHL   #1839266                          ;
                                        6A              05 FB 0018B         CALLS   #5, SOR$$ERROR                    ;
                                                        45 11 0018E         BRB     13$                               ; 2337
                            05     F3   AD              04 E1 00190  10$:   BBC     #4, FAB+67, 11$                   ; 2343
                            19     86   AD              01 E1 00195         BBC     #1, NAM+54, 12$                   ;
                                                    BC  AD DD 0019A  11$:   PUSHL   FAB+12                            ; 2350
                            00000000G   00              01 FB 0019D         CALLS   #1, SYS$DASSGN                    ;
                                                        52 DD 001A4         PUSHL   R2                                ; 2354
                                                        01 DD 001A6         PUSHL   #1                                ;
                                              001C800A  8F DD 001A8         PUSHL   #1867786                          ;
                                        6A              03 FB 001AE         CALLS   #3, SOR$$ERROR                    ;
                                                        22 11 001B1         BRB     13$                               ; 2342
                                   1E   A6          BC  AD B0 001B3  12$:   MOVW    FAB+12, 30(WFB)                   ; 2361
                                                        10 DD 001B8         PUSHL   #16                               ; 2362
                            00000000G   00              01 FB 001BA         CALLS   #1, SOR$$ALLOCATE                 ;
                                        60          14  A6 D0 001C1         MOVL    20(WFB), (RDB)                    ; 2363
                                   14   A6              50 D0 001C5         MOVL    RDB, 20(WFB)                      ;
                                   04   A0              56 D0 001C9         MOVL    WFB, 4(RDB)                       ; 2364
                                   08   A0              01 D0 001CD         MOVL    #1, 8(RDB)                        ; 2365
                                   0C   A0              01 CE 001D1         MNEGL   #1, 12(RDB)                       ; 2366
                                                    1E  A6 B5 001D5  13$:   TSTW    30(WFB)                           ; 2372
                                                        1B 12 001D8         BNEQ    14$                               ;
                                                        52 DD 001DA         PUSHL   R2                                ; 2378
                            00000000G   00              01 FB 001DC         CALLS   #1, SOR$$FREE_FILE_NAME           ;
                                                        66 DD 001E3         PUSHL   (WFB)                             ; 2379
                                                        58 DD 001E5         PUSHL   WFB_PTR                           ;
                                                        20 DD 001E7         PUSHL   #32                               ;
                            00000000G   00              03 FB 001E9         CALLS   #3, SOR$$DEALLOCATE               ;
                                                    5A  AB 97 001F0         DECB    90(CTX)                           ; 2380
                                                        1D 11 001F3         BRB     16$                               ; 2372
                                                        6C 95 001F5  14$:   TSTB    (AP)                              ; 2384
                                                        16 13 001F7         BEQL    15$                               ;
                                                    04  AC D5 001F9         TSTL    4(AP)                             ;
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                                                      11 13 001FC          BEQL    15$                                         ;
                                                      52 DD 001FE          PUSHL   R2                                          ; 2387
                                               FDEB   CF 9F 00200          PUSHAB  P.AAD                                       ;
                                                      02 DD 00204          PUSHL   #2                                          ;
                                           001C81E3   8F DD 00206          PUSHL   #1868259                                    ;
                                        6A            04 FB 0020C          CALLS   #4, SOR$$ERROR                              ;
                                        58            56 D0 0020F 15$:     MOVL    WFB, WFB_PTR                                ; 2388
                                        02            57 F4 00212 16$:     SOBGEQ  I, 17$                                      ; 2268
                                                      03 11 00215          BRB     18$                                         ;
                                                    FEAC 31 00217 17$:     BRW     5$                                          ;
                                                      6C 95 0021A 18$:     TSTB    (AP)                                        ; 2394
                                                      05 13 0021C          BEQL    19$                                         ;
                                                 04   AC D5 0021E          TSTL    4(AP)                                       ;
                                                      60 12 00221          BNEQ    23$                                         ;
                                                 5A   AB 95 00223 19$:     TSTB    90(CTX)                                     ; 2395
                                                      23 12 00226          BNEQ    20$                                         ;
                                        6E            09 D0 00228          MOVL    #9, SYS_DISK                                ; 2397
                                   04   AE     FDC8   CF 9E 0022B          MOVAB   P.AAE, SYS_DISK+4                           ;
                                   5A   AB            01 90 00231          MOVB    #1, 90(CTX)                                 ; 2405
                                                      5E DD 00235          PUSHL   SP                                          ; 2407
                                 FDC4   CF            01 FB 00237          CALLS   #1, WORK_OPEN                               ;
                                                 5A   AB 95 0023C          TSTB    90(CTX)                                     ; 2408
                                                      0A 12 0023F          BNEQ    20$                                         ;
                                           001C8014   8F DD 00241          PUSHL   #1867796                                    ; 2410
                                        6A            01 FB 00247          CALLS   #1, SOR$$ERROR                              ;
                                                         04 0024A          RET                                                 ;
                                        51     00D0   CB 9E 0024B 20$:     MOVAB   208(CTX), R1                                ; 2421
                                        50     0088   CB 3C 00250          MOVZWL  136(CTX), R0                                ; 2423
                                        50     0200   C0 9E 00255          MOVAB   512(R0), R0                                 ;
                                        61            50 D1 0025A          CMPL    R0, (R1)                                    ; 2424
                                                      03 18 0025D          BGEQ    21$                                         ;
                                        50            61 D0 0025F          MOVL    (R1), R0                                    ;
                             00006400   8F            50 D1 00262 21$:     CMPL    R0, #25600                                  ; 2421
                                                      05 18 00269          BGEQ    22$                                         ;
                                        50     6400   8F 3C 0026B          MOVZWL  #25600, R0                                  ;
                                        61            50 D0 00270 22$:     MOVL    R0, (R1)                                    ;
                         50             61 000001FF   8F C1 00273          ADDL3   #511, (R1), R0                              ; 2425
                         61             50 000001FF   8F CB 0027B          BICL3   #511, R0, (R1)                              ;
                                                         04 00283 23$:     RET                                                 ; 2427

; Routine Size:  644 bytes,    Routine Base:  SOR$RO_CODE + 09D9
; 2386          2428   1 GLOBAL ROUTINE SOR$$WRK_ALQ: CAL_CTXREG =
; 2387          2429   1
; 2388          2430   1 !++
; 2389          2431   1 !
; 2390          2432   1 ! FUNCTIONAL DESCRIPTION:
; 2391          2433   1 !
; 2392          2434   1 !       Calculate work file allocation.
; 2393          2435   1 !
; 2394          2436   1 ! FORMAL PARAMETERS:
; 2395          2437   1 !
; 2396          2438   1 !       NONE
; 2397          2439   1 !
; 2398          2440   1 ! IMPLICIT INPUTS:
; 2399          2441   1 !
; 2400          2442   1 !       NONE
; 2401          2443   1 !
; 2402          2444   1 ! IMPLICIT OUTPUTS:
; 2403          2445   1 !
; 2404          2446   1 !       NONE
; 2405          2447   1 !
; 2406          2448   1 ! ROUTINE VALUE:
; 2407          2449   1 !
; 2408          2450   1 !       Total work file allocation.
; 2409          2451   1 !
; 2410          2452   1 ! SIDE EFFECTS:
; 2411          2453   1 !
; 2412          2454   1 !       NONE
; 2413          2455   1 !
; 2414          2456   1 !--
; 2415          2457   2     BEGIN
; 2416          2458   2     EXTERNAL REGISTER
; 2417          2459   2         CTX =    COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
; 2418          2460   2     LOCAL
; 2419          2461   2         WFB:     REF WFB_BLOCK,
; 2420          2462   2         WFALQ:   INITIAL(0);
; 2421          2463   2
; 2422          2464   2     ! Loop through all the work files,
; 2423          2465   2     ! computing the total number of blocks allocated to them.
; 2424          2466   2     !
; 2425          2467   2     WFB = .CTX[S_WRK_WFB];
; 2426          2468   2     WHILE WFB[BASE_] NEQ 0 DO
; 2427          2469   2         (WFALQ = .WFALQ + .WFB[WFB_ALQ]; WFB = .WFB[WFB_NEXT]);
; 2428          2470   2     RETURN .WFALQ;
; 2429          2471   2
; 2430          2472   1     END;



                                     0000 00000              .ENTRY  SOR$$WRK_ALQ, Save nothing                    ; 2428
                                   51  D4 00002              CLRL    WFALQ                                         ; 2457
                      50      00E4  CB  D0 00004              MOVL    228(CTX), WFB                                 ; 2467
                                   09  13 00009 1$:          BEQL    2$                                            ; 2468
                      51        0C  A0  C0 0000B              ADDL2   12(WFB), WFALQ                                ; 2469
                      50            60  D0 0000F              MOVL    (WFB), WFB                                    ;
                                   F5  11 00012              BRB     1$                                            ;
```

```
                        50               51  D0 00014 2$:      MOVL    WFALQ, R0                                              ; 2470
                                             04 00017          RET                                                            ; 2472

; Routine Size:  24 bytes,    Routine Base:  SOR$RO_CODE + 0C5D
; 2432          2473   1 ROUTINE CLEAN_UP: CAL_CTXREG NOVALUE =
; 2433          2474   1
; 2434          2475   1 !++
; 2435          2476   1 !
; 2436          2477   1 ! FUNCTIONAL DESCRIPTION:
; 2437          2478   1 !
; 2438          2479   1 !       Release resources allocated by this module.
; 2439          2480   1 !
; 2440          2481   1 ! FORMAL PARAMETERS:
; 2441          2482   1 !
; 2442          2483   1 !       NONE
; 2443          2484   1 !
; 2444          2485   1 ! IMPLICIT INPUTS:
; 2445          2486   1 !
; 2446          2487   1 !       NONE
; 2447          2488   1 !
; 2448          2489   1 ! IMPLICIT OUTPUTS:
; 2449          2490   1 !
; 2450          2491   1 !       NONE
; 2451          2492   1 !
; 2452          2493   1 ! ROUTINE VALUE:
; 2453          2494   1 !
; 2454          2495   1 !       NONE (signals errors)
; 2455          2496   1 !
; 2456          2497   1 ! SIDE EFFECTS:
; 2457          2498   1 !
; 2458          2499   1 !       NONE
; 2459          2500   1 !
; 2460          2501   1 !--
; 2461          2502   2     BEGIN
; 2462          2503   2     EXTERNAL REGISTER
; 2463          2504   2         CTX =   COM_REG_CTX:    REF CTX_BLOCK_(S_FIELDS);
; 2464          2505   2     LOCAL
; 2465          2506   2         WFB:    REF WFB_BLOCK,
; 2466          2507   2         WFB_ADR:REF VECTOR[1],
; 2467          2508   2         STATUS;
; 2468          2509   2
; 2469          2510   2
; 2470          2511   2     ! Cancel the post-checkpoint handler
; 2471          2512   2     !
; 2472        U 2513   2     %IF FUN_K_CHECKPOINT %THEN
; 2473        U 2514   2     IF CHK$CANPSH NEQ 0 THEN
; 2474        U 2515   2     IF .CTX[S_PSH_HANDLER] NEQ 0
; 2475        U 2516   2     THEN
; 2476        U 2517   2         BEGIN
; 2477        U 2518   2         STATUS = CHK$CANPSH(CTX[S_PSH_HANDLER]);
; 2478        U 2519   2         IF .STATUS AND .CTX[S_RSH_HANDLER] NEQ 0 THEN
; 2479        U 2520   2         STATUS = CHK$CANRSH(CTX[S_RSH_HANDLER]);
; 2480        U 2521   2         IF NOT .STATUS
; 2481        U 2522   2         THEN
; 2482        U 2523   2             SOR$$ERROR(SOR$_SHR_SYSERROR AND NOT STS$M_SEVERITY OR STS$K_WARNING,
; 2483        U 2524   2                 0, .STATUS);
; 2484        U 2525   2         END;
; 2485          2526   2     %FI
; 2486          2527   2
; 2487          2528   2     ! Deallocate the work file event flag
; 2488          2529   2     !
; 2489          2530  2       %IF NOT HOSTILE %THEN
; 2490          2531  2       IF .CTX[S_WRK_EFN] NEQ 0
; 2491          2532  2       THEN
; 2492          2533  3           BEGIN
; 2493          2534  3           LOCAL
; 2494          2535  3               STATUS;
; 2495          2536  3           STATUS = LIB$FREE_EF(CTX[S_WRK_EFN]);
; 2496          2537  3           IF NOT .STATUS THEN SOR$$ERROR(
; 2497          2538  3                   SOR$_SHR_SYSERROR AND NOT STS$M_SEVERITY OR STS$K_ERROR,
; 2498          2539  3                   0, .STATUS);
; 2499          2540  2           END;
; 2500          2541  2       %FI
; 2501          2542  2
; 2502          2543  2       !
; 2503          2544  2       ! Deallocate the run description blocks from the active list.
; 2504          2545  2       !
; 2505          2546  3       BEGIN
; 2506          2547  3       LOCAL
; 2507          2548  3           Q:      REF VECTOR[1],
; 2508          2549  3           RUN:    REF RUN_BLOCK;
; 2509          2550  3       Q = CTX[S_RUN_INFO];
; 2510          2551  3       WHILE (RUN = .Q[0]) NEQ 0 DO DELRUN(RUN[BASE_]);
; 2511          2552  2       END;
; 2512          2553  2
; 2513          2554  2       !
; 2514          2555  2       ! For each WFB linked into this list
; 2515          2556  2       !
; 2516          2557  2       WFB_ADR = CTX[S_WRK_WFB];
; 2517          2558  2       WHILE (WFB = .WFB_ADR[0]) NEQ 0 DO
; 2518          2559  3           BEGIN
; 2519          2560  3
; 2520          2561  3           ! Deassign the channel
; 2521          2562  3           !
; 2522          2563  3           IF .WFB[WFB_CHAN] NEQ 0
; 2523          2564  3           THEN
; 2524          2565  4               BEGIN
; 2525        P 2566  4               STATUS = $DASSGN(CHAN=.WFB[WFB_CHAN]
; 2526          2567  4                   %IF HOSTILE_ELAN %THEN , ELAN = .CTX[COM_CTXADR] %FI );
; 2527          2568  4               IF NOT .STATUS THEN SOR$$ERROR(
; 2528          2569  4                   SOR$_SHR_SYSERROR AND NOT STS$M_SEVERITY OR STS$K_ERROR,
; 2529          2570  4                   0, .STATUS);
; 2530          2571  4               WFB[WFB_CHAN] = 0;
; 2531          2572  3               END;
; 2532          2573  3
; 2533          2574  3           ! Free the file name string
; 2534          2575  3           !
; 2535          2576  3           SOR$$FREE_FILE_NAME(WFB[WFB_NAME]);     ! Free name string
; 2536          2577  3
; 2537          2578  3           ! Free the RDBs linked to this WFB
; 2538          2579  3           !
; 2539          2580  4           BEGIN
; 2540          2581  4           LOCAL
; 2541          2582  4               Q:          REF VECTOR[1],
; 2542          2583  4               RDB:        REF RDB_BLOCK;
; 2543          2584  4           Q = WFB[WFB_FREE];
; 2544          2585  4           WHILE (RDB = .Q[0]) NEQ 0 DO REMLH_(Q[0], RDB, RDB_NEXT, RDB_K_SIZE);
; 2545          2586  4           Q = WFB[WFB_NOUSE];
; 2546          2587  4         WHILE (RDB = .Q[0]) NEQ 0 DO REMLH_(Q[0], RDB, RDB_NEXT, RDB_K_SIZE);
; 2547          2588  4         Q = WFB[WFB_FULL];
; 2548          2589  4         WHILE (RDB = .Q[0]) NEQ 0 DO REMLH_(Q[0], RDB, RDB_NEXT, RDB_K_SIZE);
; 2549          2590  3         END;
; 2550          2591  3
; 2551          2592  3         ! Free the WFB
; 2552          2593  3         !
; 2553          2594  3         REMLH_(WFB_ADR[0], WFB, WFB_NEXT, WFB_K_SIZE);
; 2554          2595  3
; 2555          2596  2         END;
; 2556          2597  2
; 2557          2598  2
; 2558          2599  2     ! Deallocate the buffers
; 2559          2600  2     !
; 2560          2601  3     BEGIN
; 2561          2602  3     LOCAL
; 2562          2603  3         Q:      REF VECTOR[1],
; 2563          2604  3         BUF:    REF BUF_BLOCK,
; 2564          2605  3         P:      REF BUF_BLOCK;
; 2565          2606  3     Q = CTX[S_BUF_ALLOC];
; 2566          2607  3     WHILE (P = .Q[0]) NEQ 0 DO
; 2567          2608  4         BEGIN
; 2568          2609  4         BUF = .P[BUF_ADDR];
; 2569          2610  4         BUF[BUF_NEXT] = .P[BUF_NEXT];
; 2570          2611  4         BUF[BUF_ADDR] = .P[BUF_ADDR];
; 2571          2612  4         Q[0] = BUF[BASE_];
; 2572          2613  4         REMLH_(Q[0], BUF, BUF_NEXT, .CTX[S_BUF_SIZE]+COM_K_BPERPAGE);
; 2573          2614  3         END;
; 2574          2615  2     END;
; 2575          2616  2
; 2576          2617  2
; 2577          2618  1     END;



                                                       01FC 00000 CLEAN_UP:
                                                                          .WORD   Save R2,R3,R4,R5,R6,R7,R8                  ; 2473
                                       58 00000000G  00  9E 00002         MOVAB   SOR$$ERROR, R8                             ;
                                       57 00000000G  00  9E 00009         MOVAB   SOR$$DEALLOCATE, R7                        ;
                                               00E0  CB  D5 00010         TSTL    224(CTX)                                   ; 2531
                                                     1B  13 00014         BEQL    1$                                         ;
                                               00E0  CB  9F 00016         PUSHAB  224(CTX)                                   ; 2536
                            00000000G  00            01  FB 0001A         CALLS   #1, LIB$FREE_EF                            ;
                                       0D            50  E8 00021         BLBS    STATUS, 1$                                 ; 2537
                                                     50  DD 00024         PUSHL   STATUS                                     ; 2539
                                                     7E  D4 00026         CLRL    -(SP)                                      ; 2537
                                           001C11B2  8F  DD 00028         PUSHL   #1839538                                   ; 2538
                                       68            03  FB 0002E         CALLS   #3, SOR$$ERROR                             ;
                                       53      00D8  CB  9E 00031 1$:     MOVAB   216(R11), Q                                ; 2550
                                       52            63  D0 00036 2$:     MOVL    (Q), RUN                                   ; 2551
                                                     09  13 00039         BEQL    3$                                         ;
                                                     52  DD 0003B         PUSHL   RUN                                        ;
                                FC8A   CF            01  FB 0003D         CALLS   #1, DELRUN                                 ;
                                                     F2  11 00042         BRB     2$                                         ;
                                       55      00E4  CB  9E 00044 3$:     MOVAB   228(R11), WFB_ADR                          ; 2557
```

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                   52                65  D0 00049 4$:      MOVL    (WFB_ADR), WFB                        ; 2558
                                     77  13 0004C          BEQL    13$                                   ;
                               1E    A2  B5 0004E          TSTW    30(WFB)                               ; 2563
                                     21  13 00051          BEQL    6$                                    ;
                   7E          1E    A2  3C 00053          MOVZWL  30(WFB), -(SP)                        ; 2567
         00000000G 00                01  FB 00057          CALLS   #1, SYS$DASSGN                        ;
                   56                50  D0 0005E          MOVL    R0, STATUS                            ;
                   0D                56  E8 00061          BLBS    STATUS, 5$                            ; 2568
                                     56  DD 00064          PUSHL   STATUS                                ; 2570
                                     7E  D4 00066          CLRL    -(SP)                                 ; 2568
                         001C11B2    8F  DD 00068          PUSHL   #1839538                              ; 2569
                   68                03  FB 0006E          CALLS   #3, SOR$$ERROR                        ;
                               1E    A2  B4 00071 5$:      CLRW    30(WFB)                               ; 2571
                               04    A2  9F 00074 6$:      PUSHAB  4(WFB)                                ; 2576
         00000000G 00                01  FB 00077          CALLS   #1, SOR$$FREE_FILE_NAME               ;
                   53          10    A2  9E 0007E          MOVAB   16(R2), Q                             ; 2584
                   54                63  D0 00082 7$:      MOVL    (Q), RDB                              ; 2585
                                     0B  13 00085          BEQL    8$                                    ;
                                     64  DD 00087          PUSHL   (RDB)                                 ;
                                     53  DD 00089          PUSHL   Q                                     ;
                                     10  DD 0008B          PUSHL   #16                                   ;
                   67                03  FB 0008D          CALLS   #3, SOR$$DEALLOCATE                   ;
                                     F0  11 00090          BRB     7$                                    ;
                   53          14    A2  9E 00092 8$:      MOVAB   20(R2), Q                             ; 2586
                   54                63  D0 00096 9$:      MOVL    (Q), RDB                              ; 2587
                                     0B  13 00099          BEQL    10$                                   ;
                                     64  DD 0009B          PUSHL   (RDB)                                 ;
                                     53  DD 0009D          PUSHL   Q                                     ;
                                     10  DD 0009F          PUSHL   #16                                   ;
                   67                03  FB 000A1          CALLS   #3, SOR$$DEALLOCATE                   ;
                                     F0  11 000A4          BRB     9$                                    ;
                   53          18    A2  9E 000A6 10$:     MOVAB   24(R2), Q                             ; 2588
                   54                63  D0 000AA 11$:     MOVL    (Q), RDB                              ; 2589
                                     0B  13 000AD          BEQL    12$                                   ;
                                     64  DD 000AF          PUSHL   (RDB)                                 ;
                                     53  DD 000B1          PUSHL   Q                                     ;
                                     10  DD 000B3          PUSHL   #16                                   ;
                   67                03  FB 000B5          CALLS   #3, SOR$$DEALLOCATE                   ;
                                     F0  11 000B8          BRB     11$                                   ;
                                     62  DD 000BA 12$:     PUSHL   (WFB)                                 ; 2594
                                     55  DD 000BC          PUSHL   WFB_ADR                               ;
                                     20  DD 000BE          PUSHL   #32                                   ;
                   67                03  FB 000C0          CALLS   #3, SOR$$DEALLOCATE                   ;
                                     84  11 000C3          BRB     4$                                    ; 2558
                   54        00E8    CB  9E 000C5 13$:     MOVAB   232(R11), Q                           ; 2606
                   52                64  D0 000CA 14$:     MOVL    (Q), P                                ; 2607
                                     1D  13 000CD          BEQL    15$                                   ;
                   53          04    A2  D0 000CF          MOVL    4(P), BUF                             ; 2609
                   63                62  7D 000D3          MOVQ    (P), (BUF)                            ; 2610
                   64                53  D0 000D6          MOVL    BUF, (Q)                              ; 2612
                                     63  DD 000D9          PUSHL   (BUF)                                 ; 2613
                                     54  DD 000DB          PUSHL   Q                                     ;
   7E       00D0   CB 00000200       8F  C1 000DD          ADDL3   #512, 208(CTX), -(SP)                 ;
                   67                03  FB 000E7          CALLS   #3, SOR$$DEALLOCATE                   ;
                                     DE  11 000EA          BRB     14$                                   ; 2607
                                         04 000EC 15$:     RET                                           ; 2618
```

```
; Routine Size:  237 bytes,    Routine Base:  SOR$RO_CODE + 0C75
; 2579          2619  1 END
; 2580          2620  0 ELUDOM




;                                   PSECT SUMMARY
;
;       Name                        Bytes                         Attributes
;
;    SOR$RO_CODE__________________2       4  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,  PIC,ALIGN(2)
;    SOR$RO_CODE                       3426  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,  PIC,ALIGN(2)




;                             Library Statistics
;
;                                              -------- Symbols --------        Pages     Processing
;       File                                   Total    Loaded   Percent        Mapped    Time
;
;    _$255$DUA28:[SYSLIB]STARLET.L32;1          9776       131         1          581      00:01.0
;    _$255$DUA28:[SYSLIB]XPORT.L32;1             590        29         4          252      00:00.6
;    _$255$DUA28:[SORT32.SRC]SORLIB.L32;1        409       150        36           34      00:00.4
;    _$255$DUA28:[SORT32.SRC]SRTSPC.L32;1        120         3         2           12      00:00.1





;                                    COMMAND QUALIFIERS

;       BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/NOTRACE/LIS=LIS$:SORSCRIO/OBJ=OBJ$:SORSCRIO MSRC$:SORSCRIO/UPDATE=(ENH$:SORSCRIO)

; Size:           3366 code + 64 data bytes
; Run Time:          01:23.8
; Elapsed Time:      04:29.6
; Lines/CPU Min:      1876
; Lexemes/CPU-Min: 42112
; Memory Used:  294 pages
; Compilation Complete
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0365 AH-BT13A-SE
VAX/VMS V4.0

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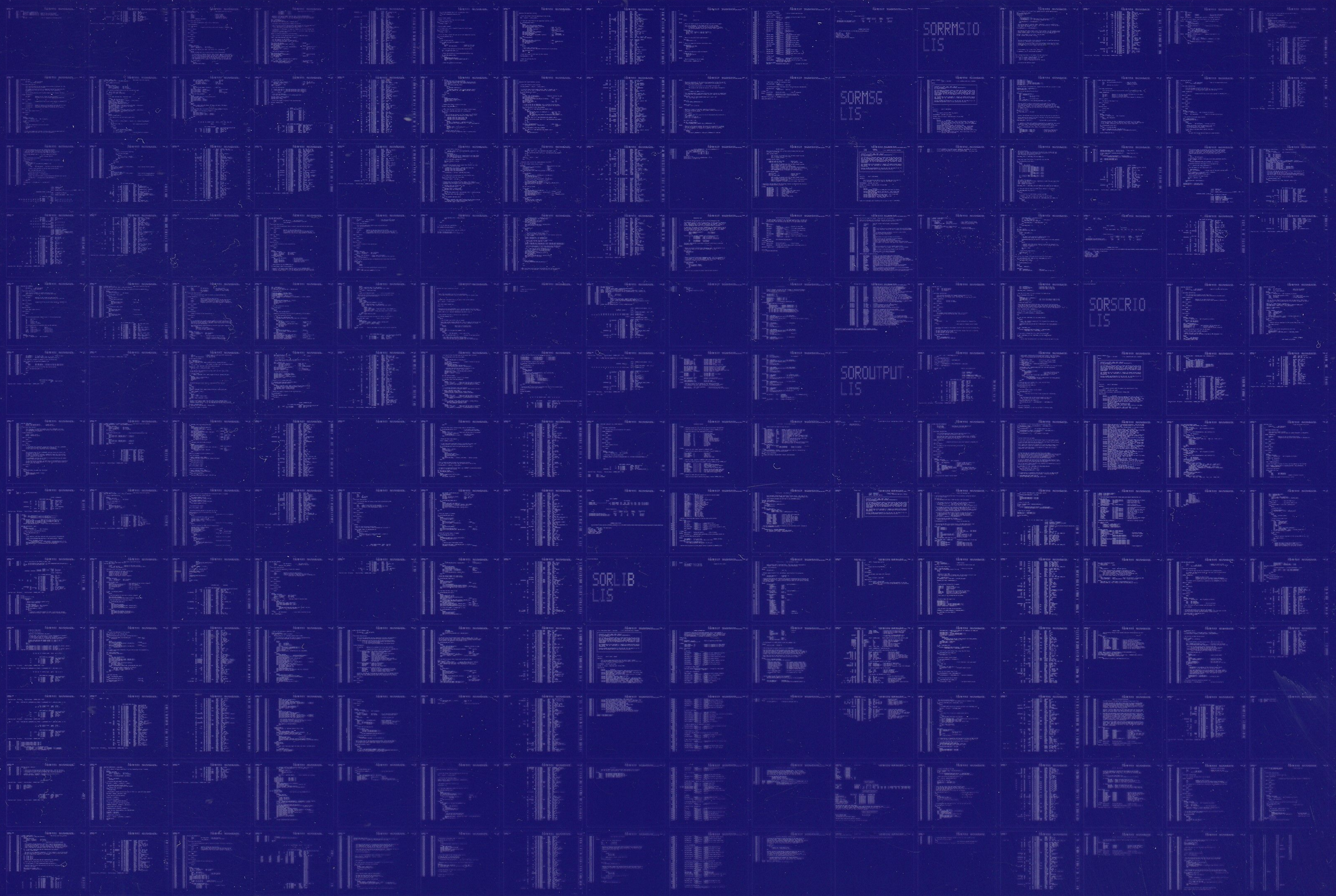

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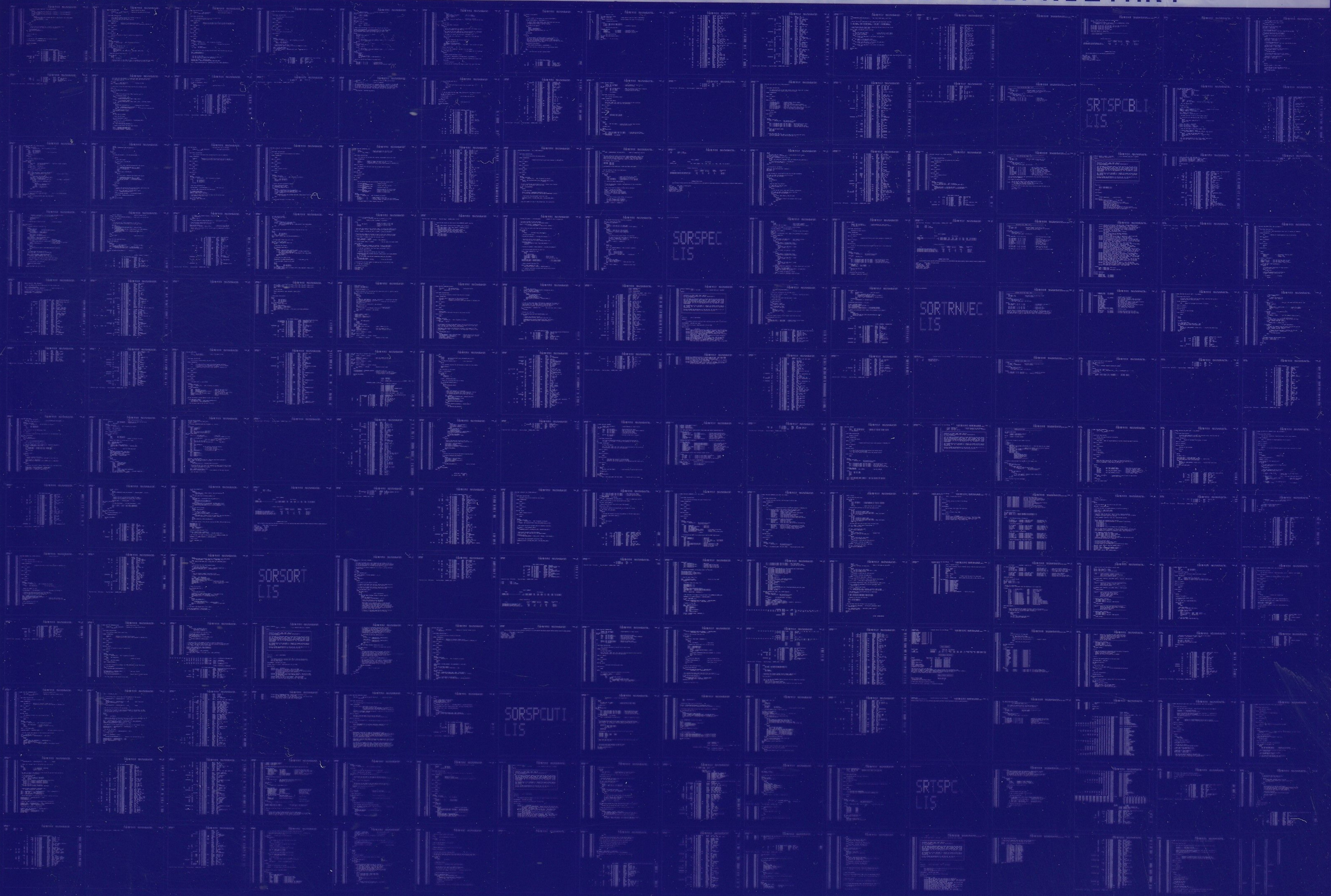

SRTSPCBLI
LIS

SORSPEC
LIS

SORTRNVEC
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SORSPCUTI
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